CITY OF GREENSBORO

ENVIRONMENTAL SERVICES DEPARTMENT

SOLID WASTE MANAGEMENT DIVISION

WHITE STREET LANDFILL

TITLE V AIR QUALITY PERMIT APPLICATION

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SCS ENGINEERS, PC

AIR OPERATING PERMIT APPLICATION
FOR THE
WHITE STREET LANDFILL
GREENSBORO, NORTH CAROLINA

Presented to:

NORTH CAROLINA DEPARTMENT OF THE ENVIRONMENT
AND NATURAL RESOURCES
DIVISION OF AIR QUALITY
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On Behalf of:

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and

CITY OF GREENSBORO
Solid Waste Management Division
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P.O. Box 3136
Greensboro, NC 27402-3136
(910) 375-2218

File No. 0298302.02
November 10, 1999

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DIVISION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY
WHITE STREET LANDFILL
FEDERAL AIR OPERATING PERMIT APPLICATION

A Federal Air Operating (Part 70) Permit is required by Title V of the 1990 Clean Air Act Amendments. Part 70 is a federally enforceable permitting program administered by the North Carolina Department of the Environment and Natural Resources (NCDENR) pursuant to Title 15A NCAC 2Q.0502 of the North Carolina Administrative Code (NCAC). A facility that meets any of the following categories is required by federal regulation to obtain a Part 70 permit:

- A major source as defined in 15A NCAC 2Q.0103(22).

- A facility subject to a standard, limitation, or other requirement under the New Source Performance Standards (NSPS) of the Clean Air Act.

- A source subject to Section 112 (Hazardous Air Pollutants Requirements) of the Clean Air Act; an affected source as defined in Title IV (Acid Rain Program Requirements); or a facility in a source category designated by the EPA pursuant to 40 CFR Section 70.3.

The permitted design capacity of the White Street Landfill (Landfill) was increased to greater than 2.5 million Megagrams (Mg), or 2.75 million tons, after May 30, 1991. Therefore, the Landfill is regulated according to the New Source Performance Standards (NSPS). Municipal solid waste (MSW) landfills, as stated in the preamble (Section VIII.B.) of the NSPS, above the 2.5 million Mg design capacity are required to obtain Part 70 operating permits, regardless of whether the landfill will be required to install a collection and control system.

This permit application addresses the applicable air pollution regulations that affect both the entire facility ("facility-wide") and individual pollution sources. The individual pollution sources, or emission sources, are designated according to the instructions that accompanied the permit application form. The on-site emission sources for which there are applicable state or federal air pollution rules and the potential emissions for each unit are based upon 2003 emissions and are summarized below:

- **ES-1, ES-2, and ES-3:** MSW landfill cells (Permit No. 41-03). The total non-methane organic compound (NMOC) fugitive potential emissions are estimated to be 4.8 tons per year (tpy). Fugitive volatile organic compound (VOC) potential emissions are estimated to be 1.9 tpy, while the total potential hazardous air pollutant (HAP) emissions (i.e., total HAPs) are estimated to be 2.8 tpy. See Division D, Section 2 for an explanation of the emissions calculations.

- **ES-4:** A 850 hp tub grinder is used to process stumps, brush, pallets, and yard waste for use in an anaerobic digester or recycled as mulch. Significant potential emissions from the tub grinder include 1.1 tpy of VOCs, 38.2 tpy of nitrogen oxides, 8.8 tpy of carbon monoxide, 12.9 tpy of sulfur oxides, and

0.64 tpy of PM-10 emissions. An explanation of the tub grinder emissions is presented in Division D, Section 6.

- **ES-5:** This emission unit represents the insignificant activities of the leachate collection and management facility. A description of the leachate collection system and emissions calculation can be found in Division D, Section 4.

- **ES-6:** This emission unit represents the yard waste anaerobic digestion facility. The emission activities at the anaerobic digester are limited to the candle flare (CD-2) and otherwise considered insignificant. The emission calculations are presented in Division D, Section 5.

- **ES-7:** A 10,000 gallon unleaded gasoline storage tank is used to store fuel for site vehicles and machinery, The VOC emissions from this tank are estimated to be 0.097 tons per year. HAP emissions were set equal to the VOC emissions in an effort to be conservative. An explanation of the gasoline storage tank emissions is presented in Division D, Section 7.

- **ES-8:** A 20,000 gallon diesel fuel storage tank is also used on site to fuel facility vehicles and machinery. The VOC and HAP emissions from this tank are considered insignificant. An explanation of the diesel storage tank is shown in Division D, Section 7.

- **CD-1:** The landfill gas (LFG) candle flare, which combusts LFG collected from the landfill cells, is considered a control device. The flare serves as a back-up LFG destruction option to an LFGTE pipeline project at the Landfill. During LFG combustion, the flare destroys non-methane organic compounds (NMOCs) and VOCs that would otherwise be emitted to the atmosphere. The potential VOC and HAP emissions from the flare are estimated to be 0.11 and 0.17 tpy, respectively. Other flare potential emissions include 25.0 tpy of nitrogen oxides, 136.1 tpy of carbon monoxide, 5.8 tpy of sulfur oxides, and 6.1 tpy of PM-10 emissions. The calculations for these emissions, as well as a detailed description of the LFG utility flare, is presented in Division D, Section 3.

- **CD-2:** A second utility flare, which combusts biogas collected from the anaerobic digesters, is also considered a control device. As with the LFG flare (CD-1), this flare also serves as back-up biogas destruction to the current LFGTE pipeline project. Due to the recent design of yard waste digesters, VOC and HAP emissions factors were not readily available. Therefore, a conservative estimate for VOC and HAP emissions was estimated at 0.0002 tpy (each), respectively. Nitrogen oxide (6.3 tpy), carbon monoxide (34.4 tpy), sulfur oxide (1.6 tpy), and PM-10 (1.6) potential emissions from the biogas flare are estimated in Division D, Section 5.

WHITE STREET LANDFILL POTENTIAL EMISSIONS SUMMARY (tpy)

	VOCs	HAPs	NO_X	CO	NMOC	SO_X	PM-10 [3]
Total Landfill Emissions [1]	3.2	3.1	69.5	179.3	4.8	20.3	8.3
Total Landfill Emissions [2] (excluding control devices)	3.2	3.1	69.5	8.8	4.8	20.3	8.3

[1] Total landfill emissions include all potential emissions from the Landfill.
[2] Total landfill emissions (excluding control devices) include all potential emissions from the Landfill, minus the CO emissions associated with the utility flares.
[3] The PM-10 emissions do not include potential particulate emissions from roadways, landfilling operations, or the borrow area.

Division D of this permit application details the potential emissions and expected actual emissions generated by the emission units at the Landfill. Table 1B on page 3 in Division D, summarizes the *potential emissions* at the site, while Table 1C on page 4 in Division D summarizes the *actual emissions*.

As defined in North Carolina's Title V Program – 15A NCAC 2Q.0103(22), the importance of the distinction between potential emissions and actual emissions of a source is that a facility's "major source" status is based upon *potential emissions*. Conversely, the annual Title V emission-based fees are based upon the *actual emissions* of a source. The emission fees are calculated with reference to the Annual Emissions Statement, submitted to the NCDENR.

The determination of major source status for a facility is based on the following criteria:

- A stationary source that has the *potential to emit* 10 tons per year (tpy) or more of any hazardous air pollutant (HAP) that has been listed in Section 112(b) of the Clean Air Act; or 25 tpy or more of any combination of HAPs.

- A stationary source that emits, or has the *potential to emit*, 100 tpy of any *regulated* air pollutant including fugitive emissions, as determined by Section 302 of the Clean Air Act.

A source subject to a standard under Section III of the Clean Air Act (CAA) must include fugitive emissions in determining whether it is a major source for regulated air pollutants. Although the facility has a potential to emit 179.3 tpy of carbon monoxide, it is not considered a major source by emission level since the candle flares (i.e., control devices) account for 170.5 tpy of the emitted carbon monoxide. Control devices are considered secondary sources and their carbon monoxide emissions are excluded by the NCDENR from major source determination (See Appendix E, Carbon Monoxide Emissions Variance Memorandum). By excluding the utility flares for both the LFG collection system and the biogas collection system, the facility *potential to emit* is less than the 100 tpy threshold for all regulated air pollutants and the 10/25 tpy limits for HAPs. Therefore, the White Street Landfill does not meet either of the above criteria for regulated pollutants and is not a major source.

DIVISION B

AIR OPERATING PERMIT APPLICATION

SECTION A

FACILITY (General Information)

A1

EVISED 04/15/94 AIR QUALITY SECTION - APPLICATION FOR AIR PERMIT TO CONSTRUCT/OPERATE

FACILITY NAME: White Street Landfill

ADDRESS: P.O. Box 3136	SITE ADDRESS: 2503 White Street
CITY: Greensboro	CITY: Greensboro COUNTY: Guilford
STATE: North Carolina ZIP CODE: 27402-3136	ZIP CODE: 27405
CONTACT PERSON: Frank Coggins	TITLE: Landfill Manager
TELEPHONE: (910) 375-2218 FAX: (910) 375-2215	

OWNER OF FACILITY: City of Greensboro

MAILING ADDRESS: P.O. Box 3136

CITY: Greensboro	STATE: North Carolina	ZIP CODE: 27402-3136
CONTACT PERSON: Jeryl W. Covington		TITLE: Technical and Planning Support Manager
TELEPHONE: (336) 373-2787	FAX: (336) 373-2988	

DESCRIBE TYPE OF OPERATION: Municipal Sanitary Landfill

SIC CODE(S): 4953 — DESCRIPTION OF PRIMARY SIC GROUP: Sanitary Services

FACILITY COORDINATES		OR	
	UTM EAST: 1,787,145.52		LATITUDE:
	UTM NORTH: 860,004.1		LONGITUDE:

HAVE YOU INCLUDED (x) CONSISTENCY DETERMINATION ( ) SOURCE REDUCTION & RECYCLING FORM D3-3 ( ) APPLICATION FEE?

FACILITY IS: (x) TITLE V FACILITY ( ) NON-TITLE V FACILITY ( ) SYNTHETIC MINOR

TITLE V INDICATE APPLICABILITY 1 2 3 4 5 (CIRCLE ALL THAT ARE APPLICABLE)

APPLICATION IS BEING MADE FOR (CHECK ALL THE APPLY, NOTE: (TV) INDICATES APPLICABILITY TO TITLE V FACILITIES ONLY):

( ) NEW FACILITY	(x) INITIAL TITLE V PERMIT (TV)	( ) RENEWAL (TV)
( ) MODIFICATION	( ) NEW FACILITY (TV)	( ) PSD (TV)
( ) EXISTING EMISSION SOURCE(S)	( ) MINOR MODIFICATION (TV)	( ) NON-ATTAINMENT (TV)
	( ) SIGNIFICANT MODIFICATION (TV	( ) 112 (g) (TV)

IF APPLICATION IS BEING MADE FOR ANY OF THE FOLLOWING, FORM A2 MUST BE ATTACHED TO THIS FORM:

( ) ADMINISTRATIVE AMENDMENT	( ) CHANGE OF OWNERSHIP	( ) RELOCATION (WITHIN FACILITY) (TV)
( ) ADMINISTRATIVE AMENDMENT (TV)	( ) CHANGE OF OWNERSHIP (TV)	( ) LIKE-FOR-LIKE REPLACEMENT
( ) RENEWAL	( ) RELOCATION (WITHIN FACILITY)	( ) LIKE-FOR-LIKE REPLACEMENT (TV)
		( ) 502(b)(10) NOTIFICATION (TV)

HAVE YOU INCLUDED: (x) FLOW CHART(S) ( ) ROOF DIAGRAM ( ) PLANT LAYOUT (x) PLOT PLAN (x) AREA DIAGRAM

CURRENT/PREVIOUS PERMIT NO: — EXPIRATION/DISCONTINUED DATE:

DO YOU CLAIM CONFIDENTIALITY OF DATA ( ) YES (x) NO *(SEE INSTRUCTIONS)*

SIGNATURE OF RESPONSIBLE PERSON OR COMPANY OFFICIAL: TITLE: DATE:

X

(TYPED) Jeryl W. Covington — Technical and Planning Support Manager

DEPARTMENT USE ONLY:	RECEIVED:	ASSIGNED TO:	PREMISE NUMBER:
APPLICATION NUMBER:	RETURNED:	COMPLETE:	REVIEW DATE:
PERMIT NUMBER:	DATE ISSUED:		

A3

SECTION A

EMISSION SOURCE LISTING (EXISTING FACILITY)

(New, Modified, Previously Unpermitted, Replaced, Deleted)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION	EMISSION POINT ID NO. or "FUGITIVE"
EQUIPMENT TO BE MODIFIED BY THIS APPLICATION				
EQUIPMENT TO BE ADDED BY THIS APPLICATION (New, Previously Unpermitted, or Replacement)				
ES-1	Closed MSW LF Cell Permit 41-03	CD-1	Candlestick Flare	EP-1
ES-2	Closed MSW LF Cell Permit 41-03	CD-1	Candlestick Flare	EP-1
ES-3	Active MSW LF Cell Permit 41-03	CD-1	Candlestick Flare	EP-1
ES-4	Tub Grinder			EP-2
ES-5	Leachate Management			Insignificant
ES-6	Anaerobic Compost Digester	CD-2	Candlestick Flare	EP-3
ES-7	Unleaded Gasoline Storage Tank			EP-4
ES-8	Diesel Fuel Storage Tank			Insignificant
EQUIPMENT TO BE DELETED BY THIS APPLICATION				
EQUIPMENT TO BE REPLACED BY THIS APPLICATION				

EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO ES-1, ES-2, ES-3

CONTROL DEVICE ID NO: CD-1

PRIMARY OPERATING SCENARIO (DESCRIBE):

The anaerobic decomposition of the buried municipal solid waste (MSW) materials in the closed cells (ES-1 and ES-2) and in the active cell (ES-3) produces landfill gas (LFG) which contains methane. The LFG is collected by a series of vertical extraction wells and horizontal collectors, then conveyed by a blower system to an off-site industrial user or an on-site candlestick flare (CD-1). The industrial facility uses the LFG for boiler fuel via a pipeline from the Landfill, while the flare provides back-up and supplemental LFG combustion capacity. See Division D for more information.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

SECTION B
EMISSION SOURCE (GENERAL)

B1

AIR QUALITY SECTION

REVISED 04/15/94

EMISSION SOURCE DESCRIPTION: Closed MSW LF Cell, Permit No. 41-03 | EMISSION SOURCE ID NO: ES-1

CONTROL DEVICE ID NO(S): CD-1 | EMISSION POINT ID NO(S): EP-1

INDICATE WHETHER THIS SOURCE IS SUBJECT TO (x) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE PROCESS: The closed MSW landfill cell, Phase I (Permit No. 41-03), consisting of approximately 85 acres, received waste from 1965 to 1978. ES-1 contains approximately 2.72 million tons of refuse and has received a soil cap. The anaerobic decomposition of the buried MSW material produces LFG which is collected and conveyed to an industrial end-user or CD-1.

OPERATION DATE: January 1965

SEASONAL VARIATION (%)	JAN-MAR 25	APR-JUN: 25	JUL-SEP: 25	OCT-DEC: 25

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION (UNIT/HR)
Landfill gas: approximately 50 percent methane	cubic feet	168,000 cf/hr	168,000 cf/hr

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN CAPACITY (BATCHES/YR): | MAXIMUM DESIGN CAPACITY (BATCHES/HR):

FUEL USED: | TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

MAX. CAPACITY HOURLY FUEL USE: | MAX. CAPACITY ANNUAL FUEL USE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS:
The blower/flare station control panel provides temperature and pressure readings. Monitoring ports have been installed at various locations throughout the system in order to measure gas quality and flow.

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc.) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS: 1. Operation date indicates when ES-1 began receiving waste.
2. Maximum design capacity is based on a maximum LFG capacity of the flare, 2,800cfm.
3. Requested capacity limitation has been set to equal maximum design capacity to account for variations in LFG generation.
4. Since ES-1, ES-2, & ES-3 convey LFG to the same control device (CD-1) and emit from the same emissions point (EP-1), the same value has been cited for the ES-1, ES-2 & ES-3 design capacities.

SECTION B
EMISSION SOURCE (GENERAL)

B1

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Closed MSW LF Cell, Permit No. 41-03

EMISSION SOURCE ID NO: ES-2

CONTROL DEVICE ID NO(S): CD-1

EMISSION POINT ID NO(S): EP-1

INDICATE WHETHER THIS SOURCE IS SUBJECT TO (x) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE PROCESS: The closed MSW landfill cell, Phase II (Permit No. 41-03), consisting of approximately 120 acres, received waste from 1978 to 1998. ES-2 contains approximately 5.5 million tons of refuse and has received a soil cap. The anaerobic decomposition of the buried MSW material produces LFG which is collected and conveyed to an industrial end-user or CD-1.

OPERATION DATE: January 1978

SEASONAL VARIATION (%)	JAN-MAR 25	APR-JUN: 25	JUL-SEP: 25	OCT-DEC: 25

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION (UNIT/HR)
Landfill gas: approximately 50 percent methane	cubic feet	168,000 cf/hr	168,000 cf/hr

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN CAPACITY (BATCHES/YR):

MAXIMUM DESIGN CAPACITY (BATCHES/HR):

FUEL USED:

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

MAX. CAPACITY HOURLY FUEL USE:

MAX. CAPACITY ANNUAL FUEL USE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS:
The blower/flare station control panel provides temperature and pressure readings. Monitoring ports have been installed at various locations throughout the system in order to measure gas quality and flow.

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc.) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS: 1. Operation date indicates when ES-2 began receiving waste.
2. Maximum design capacity is based on a maximum LFG capacity of the flare, 2,800 scfm.
3. Requested capacity limitation has been set to equal maximum design capacity to account for variations in LFG generation.
4. Since ES-1, ES-2, & ES-3 convey LFG to the same control device (CD-1) and emit from the same emissions point (EP-1), the same value has been cited for the ES-1, ES-2 & ES-3 design capacities.

SECTION B
EMISSION SOURCE (GENERAL)

B1

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Active MSW LF Cell, Permit No. 41-03

EMISSION SOURCE ID NO: ES-3

CONTROL DEVICE ID NO(S): CD-1

EMISSION POINT ID NO(S): EP-1

INDICATE WHETHER THIS SOURCE IS SUBJECT TO (x) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE PROCESS: The active MSW landfill cell, Phase III (Permit No. 41-03), consisting of approximately 52 acres, has a design capacity of 4.2 million tons. ES-3 began accepting waste on January 1, 1998 and has a Subtitle D liner and leachate collection system. The anaerobic decomposition of the buried MSW material produces LFG which is collected and conveyed to an industrial end-user or CD-1.

OPERATION DATE: January 1998

SEASONAL VARIATION (%)	JAN-MAR	APR-JUN:	JUL-SEP:	OCT-DEC:
	25	25	25	25

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION (UNIT/HR)
Landfill gas: approximately 50 percent methane	cubic feet	168,000 cf/hr	168,000 cf/hr

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN CAPACITY (BATCHES/YR):

MAXIMUM DESIGN CAPACITY (BATCHES/HR):

FUEL USED:

TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

MAX. CAPACITY HOURLY FUEL USE:

MAX. CAPACITY ANNUAL FUEL USE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS:
The blower/flare station control panel provides temperature and pressure readings. Monitoring ports have been installed at various locations throughout the system in order to measure gas quality and flow.

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc.) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS: 1. Operation date indicates when ES-3 began receiving waste.
2. Maximum design capacity is based on a maximum LFG capacity of the flare, 2,800 scfm.
3. Requested capacity limitation has been set to equal maximum design capacity to account for variations in LFG generation.
4. Since ES-1, ES-2, & ES-3 convey LFG to the same control device (CD-1) and emit from the same emissions point (EP-1), the same value has been cited for the ES-1, ES-2 & ES-3 design capacities.

SECTION C
CONTROL DEVICE (GENERAL)

C1

REVISED 04/15/94

AIR QUALITY SECTION

CONTROL DEVICE ID NO: CD-1	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S ES-1, ES-2, ES-3
EMISSION POINT ID NO(S): EP-1	*POSITION IN SERIES OF CONTROLS* NO. 1 OF 1 UNITS
MANUFACTURER: LFG SPECIALTIES, INC.	MODEL NO: 14-inch Utility Flare
ALTERNATIVE OPERATING SCENARIOS (AOS) NO:	

DESCRIBE CONTROL SYSTEM: A blower unit applies vacuum to the landfill through a series of vertical and horizontal collection piping. This piping conveys the LFG to a utility flare where it is combusted at a 98 percent destruction efficiency, as stated by the manufacturer. The collection efficiency of the LFG piping is assumed to be 75 percent of LFG generation.

POLLUTANT(S) COLLECTED:		NMOC	VOC	HAP	
CORRESPONDING EFFICIENCY:	*	75 %	75 %	75 %	%
EFFICIENCY DETERMINATION CODE:		4	4	4	
BEFORE CONTROL EMISSION RATE (LB/HR):	**	4.41	1.71	2.56	
AFTER CONTROL EMISSION RATE (LB/HR):	***	1.1	0.43	0.64	

PRESSURE DROP (IN. H20) MIN 0 MAX 5	
INLET TEMERATURE (F): MIN 50 MAX 100	OUTLET TEMPERATURE (F): MIN 1100 MAX 1600
INLET AIR FLOW RATE (ACFM):	OUTLET AIR FLOW RATE (ACFM): 11,100
INLET AIR FLOW VELOCITY (FT/SEC):	OUTLET AIR FLOW VELOCITY (FT/SEC): 173
INLET MOISTURE CONTENT (%): Approx. 7 percent	
COLLECTION SURFACE AREA (FT2): Landfill	FUEL USED: N/A — FUEL USAGE RATE: N/A

DESCRIBE STARTUP PROCEDURES: A propane gas pilot system provides fuel to the flare while an electric ignitor provides the initial combustion source needed to ignite the burner unit. LFG is then routed to the flare, providing continuous combustion.

DESCRIBE MAINTENANCE PROCEDURES: The utility flare shall be maintained in accordance with manufacturer's recommendations.

DESCRIBE ANY AUXILARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:
A control panel provides temperature gauges. Monitoring ports have been installed in order to obtain gas quality, pressure, and flow measurements.

SHOW BY DIAGRAM THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

See Appendix B

ATTACH MANUFACTURER'S SPECIFICATIONS, SCHEMATICS, AND ALL OTHER DRAWINGS NECESSARY TO DESCRIBE THIS CONTROL DEVICE AND ITS RELATIONSHIP TO ITS EMISSION SOURCE. See Appendix C

COMMENT N/A: Not Applicable

* AP-42 guidance states that a collection efficiency of 75 percent may be used to represent the average LFG collection system.

** Values representative of potential LFG generation.

*** Values represent fugitive emissions from the landfill which equal 25 percent of potential LFG generation.

1. As a worst case scenario, potential emissions from the year 2003 were used.

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Closed and Active MSW LF Cells, Phases I, II, and III, Permit No. 41-03

EMISSION SOURCE ID NO ES-1,ES-2,ES-3 | IS THIS SOURCE A FUGITIVE SOURCE? (X) YES ( ) NO

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
NMOC	1	1.1	1.0	9,600	9,000
VOC	3	0.43	0.41	3,800	3,600
HAP	1 + 3	0.64	0.62	5,600	5,400

COMMENTS:

1. Emissions from 2003 were used representing a worst case scenario for potential emissions.
2. The average emissions for the 5 year permitting period were used to determine actual emissions.
3. The emission rates given represent fugitive emissions (25 percent of total LFG generation) based on 75 percent collection efficiency by the system.

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Closed MSW LF Cell, Phase I, Permit No. 41-03	
EMISSION SOURCE ID NO: ES-1	ALTERNATIVE OPERATING SCENARIO (AOS) NO:

REGULATED POLLUTANT	EMISSION AND OPERATING LIMITS	APPLICABLE REGULATION
NMOC	Because the NMOC emissions estimates for the years 1998	40 CFR Part 60
	through 2003 are below 50 Mg/yr, the Landfill is not required	
	to prepare an updated NMOC emissions estimate or retest	
	the site-specific NMOC concentration for another 5 years. The	
	landfill owner will compare the actual waste receipts received	
	in future years with the projected quantities used in the Tier 2	
	estimate. If the actual waste receipts exceed the projected	
	quantities for the year, NMOC emission estimates will be	
	recalculated using the actual filing rates.	

COMMENTS:

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Closed MSW LF Cell, Phase II, Permit No. 41-03

EMISSION SOURCE ID NO: ES-2 | ALTERNATIVE OPERATING SCENARIO (AOS) NO:

REGULATED POLLUTANT	EMISSION AND OPERATING LIMITS	APPLICABLE REGULATION
NMOC	Because the NMOC emissions estimates for the years 1998 through 2003 are below 50 Mg/yr, the Landfill is not required to prepare an updated NMOC emissions estimate or retest the site-specific NMOC concentration for another 5 years. The landfill owner will compare the actual waste receipts received in future years with the projected quantities used in the Tier 2 estimate. If the actual waste receipts exceed the projected quantities for the year, NMOC emission estimates will be recalculated using the actual filing rates.	40 CFR Part 60

COMMENTS:

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Active MSW LF Cell, Phase III, Permit No. 41-03

EMISSION SOURCE ID NO: ES-3 | ALTERNATIVE OPERATING SCENARIO (AOS) NO:

REGULATED POLLUTANT	EMISSION AND OPERATING LIMITS	APPLICABLE REGULATION
NMOC	Because the NMOC emissions estimates for the years 1998 through 2003 are below 50 Mg/yr, the Landfill is not required to prepare an updated NMOC emissions estimate or retest the site-specific NMOC concentration for another 5 years. The landfill owner will compare the actual waste receipts received in future years with the projected quantities used in the Tier 2 estimate. If the actual waste receipts exceed the projected quantities for the year, NMOC emission estimates will be recalculated using the actual filing rates.	40 CFR Part 60

COMMENTS:

EMISSION SOURCE DESCRIPTION: Closed and Active MSW LF Cells, Permit No. 41-03

EMISSION SOURCE ID NO: ES-1, ES-2, ES-3

REGULATED POLLUTANT **	ONGOING SOURCE REDUCTION ACTIVITIES (ENTER CODES)	QTY. EMITTED BEFORE REDUCTION (LBS/YR)	QTY. EMITTED AFTER REDUCTION (LBS/YR)	PLANNED SOURCE REDUCTION ACTIVITIES (ENTER CODES)
NMOC	W99 ***	38,400	9,600	
VOC	W99 ***	15,200	3,800	
HAP*	W99 ***	22,400	5,600	

COMMENTS:

* Values represent a spreadsheet calculation using AP-42, Section 2.4 guidance.

** Represents emissions from ES-1, ES-2, and ES-3.

*** Reduction of regulated MSW landfill emissions.

1. Data is based on 2003 emissions estimates.

2. LFG collection system efficiency is assumed to be 75 percent.

SECTION E
COMPLIANCE PLAN (METHOD OF COMPLIANCE)

E4

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO. ES-1, ES-2, ES-3 REGULATED POLLUTANT NMOC

APPLICABLE REGULATION

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

MONITORING REQUIREMENTS

IS ENHANCED MONITORING APPLICABLE? ( ) YES (X) NO

IS ENHANCED MONITORING PROTOCOL ATTACHED? ( ) YES (X) NO

MONITORING DEVICE TYPE:

MONITORING LOCATION:

OTHER MONITORING METHODS (DESCRIBE IN DETAIL):

GENERALLY DESCRIBE THE FREQUENCY AND DURATION OF MONITORING AND HOW THE DATA WILL BE RECORDED (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

TEST METHODS

REFERENCE TEST METHOD DESCRIPTION: Tier 2 sampling in accordance with New Source Performance Standards (NSPS) (40 CFR Part 60)

REFERENCE TEST METHOD CITATION:

RECORDKEEPING REQUIREMENTS

DATA (PARAMETER) BEING RECORDED: Annual waste receipts

FREQUENCY OF RECORDKEEPING (HOW OFTEN IS DATA RECORDED): Waste receipts are obtained as vehicles enter the facility by the use of scales.

REPORTING REQUIREMENTS

GENERALLY DESCRIBE WHAT IS REPORTED: Because the NMOC emissions estimates for the year 1998 through 2003 are below 50 Mg/yr, the Landfill is not required to prepare an updated NMOC emissions estimate or retest the site-specific NMOC concentration for another 5 years. The Landfill owner will compare the actual waste receipts received in future years with the projected quantities used in the Tier 2 estimate. If the actual waste receipts exceed the projected quantities for the year, NMOC emission estimates will be recalculated using the actual filling rates.

FREQUENCY: ( ) MONTHLY ( ) QUARTERLY ( ) ONCE EVERY 6 MONTHS

( ) ONE PER YEAR (X) OTHER (DESCRIBE) 5 years

EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS **A5**

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO ES-4	
CONTROL DEVICE ID NO:	

PRIMARY OPERATING SCENARIO (DESCRIBE):

The tub grinder (ES-4) processes stumps, brush, pallets, railroad ties, bark, and green waste. Its purpose is to provide wood waste disposal, reduction, and recycling through the anaerobic digester and mulch pile. See the Emissions Inventory, Section 6 of Division D.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

SECTION B
EMISSION SOURCE (GENERAL)

B1

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Tub Grinder	EMISSION SOURCE ID NO: ES-4
CONTROL DEVICE ID NO(S):	EMISSION POINT ID NO(S): EP-2

INDICATE WHETHER THIS SOURCE IS SUBJECT TO ( ) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE PROCESS: Wood waste such as brush, pallets, demolition and land clearing debris, and yard waste are placed into a tub with a feed opening and screen at its center. The wood waste is then shredded into compost. This process provides wood waste disposal, reduction, and recycling.
The wood/yard waste is then segregated by size, with material less than 2 inches input into the anaerobic digesters and the remainder set aside as mulch.

OPERATION DATE: September 1999

SEASONAL VARIATION (%)	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
	25	25	25	25

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Wood and yard wastes	tons	70 tons/hr*	70 tons/hr*

MATERIALS ENTERING PROCESS - BATCH OPERATION TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN CAPACITY (BATCHES/YR):	MAXIMUM DESIGN CAPACITY (BATCHES/HR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	MAX. CAPACITY ANNUAL FUEL USE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS:

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc.) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS:

* Value represents an average production rate obtained from Morbark, Inc.

1. See Emissions Inventory, Section 6 of Division D.

EMISSION SOURCE (OIL/GAS FIRED BURNER)

B3

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION: Tub Grinder | EMISSION SOURCE ID NO: ES-4

CONTROL DEVICE ID NO(S): | EMISSION POINT ID NO(S): EP-2

INDICATE WHETHER THIS SOURCE IS SUB ( ) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE USE: ( ) PROCESS HEAT ( ) SPACE HEAT ( ) ELECTRICAL GENERATION

( ) CONTINUOUS US ( ) STAND BY/EMERGENCY (X) OTHER

OPERATION DATE: Sep-99

SEASONAL VARIATION (%)	JAN-MAR: 25	APR-JUN: 25	JUL-SEP: 25	OCT-DEC: 25

MANUFACTURER: Morbark | MODEL NO: 1300

TYPE OF BOILER ( ) UTILITY ( ) INDUSTRIAL ( ) COMMERCIAL ( ) RESIDENTIAL

MAXIMUM FIRING RATE (MILLION BTU/HOUR): 5.48

FUEL USAGE (INCLUDE STARTUP FUEL)		MAX. DESIGN	REQUESTED CAPACITY
FUEL TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION (UNIT/HR)
Diesel	Gallons	40	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)			SULFER CONTENT
FUEL TYPE	BTU CONTENT	UNITS	(% BY WEIGHT)

METHOD OF TUBE CLEANING: | CLEANING SCHEDULE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS:

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS:

Calculations assume that a Caterpillar Industrial Engine, Model No. 3412C was used. The diesel heating value was obtained from AP-42, page 3.3-2, 44,900 J/gal.

44,900 J/gal.* 851 gal. / L = 38,209,900 J / L* 1BTU / 1054.35 J = 0.03624 MMBTU / L* 3.78 L/gal. = 0.137 MMBTU / gal. of diesel

40.0 gal. Of diesel / hour * 0.137 MMBTU / gal. of diesel = 5.48 MMBTU / hour

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION:		Tub Grinder			
EMISSION SOURCE ID NO:	ES-4	IS THIS SOURCE A FUGITIVE SOURCE? ( ) YES (X) NO			
ALTERNATIVE OPERATING SCENARIO (AOS) NO:					

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
VOC	3	0.25	0.16	2,200	1,400
HAP	3	0.01	0.007	100	60
NOx	3	8.74	5.46	76,400	47,800
CO	3	2.01	1.26	17,600	11,000
SOx	3	2.94	1.83	25,800	16,000
PM-10	3	0.15	0.09	1,280	800

COMMENTS:

tons/year * 2,000 lbs./ton * 1 year/365 days * 1 day/24 hours = lbs./hour

SECTION A
EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS

A5

REVISED 04/15/94 — AIR QUALITY SECTION

EMISSION SOURCE ID NO: ES-5

CONTROL DEVICE ID NO:

PRIMARY OPERATING SCENARIO (DESCRIBE):

Leachate generated by the buried waste is collected by the leachate collection system and gravity fed to the leachate storage tanks. Stored leachate is then pretreated and pumped via pipeline to the local wastewater treatment plant (POTW) for off-site treatment and ultimate disposal. See Emissions Inventory, Section 4 of Division D.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION:	Leachate Management		
EMISSION SOURCE ID NO:	ES-5	IS THIS SOURCE A FUGITIVE SOURCE?	( ) YES (X) NO
ALTERNATIVE OPERATING SCENARIO (AOS) NO:			

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
VOC	1	1.2 x 10^-4	1.2 x 10^-4	1.04	1.04
HAP	1	1.2 x 10^-4	1.2 x 10^-4	1.04	1.04

COMMENTS:

1. As a worst case scenario, actual emissions were set equal to potential emissions.

SECTION A

EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS

A5

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO	ES-6
CONTROL DEVICE ID NO:	CD-2

PRIMARY OPERATING SCENARIO (DESCRIBE):

Yard and wood waste is ground in the tub grinder (ES-4) and then blended with water to create a slurry in a day tank. The slurry is pumped to an elevated preparatory tank that feeds 3 anaerobic digesters. The slurry is anaerobically decomposed for a period of 45 to 50 days in which time biogas is produced. The biogas is conveyed by the Landfill LFG blower system which delivers the gas to an industrial end-user or a candlestick flare (CD-2). The industrial site uses the gas as boiler fuel while the flare provides back-up and supplemental biogas combustion capacity.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

1. For additional information, see Division D, Section 5.

B1

SECTION B
EMISSION SOURCE (GENERAL)
AIR QUALITY SECTION

REVISED 04/15/94

EMISSION SOURCE DESCRIPTION: Anaerobic Digesters	EMISSION SOURCE ID NO: ES-6
CONTROL DEVICE ID NO(S): CD-2	EMISSION POINT ID NO(S): EP-3

INDICATE WHETHER THIS SOURCE IS SUBJECT TO ( ) NSPS OR ( ) NESHAP REGULATIONS.

ALTERNATIVE OPERATING SCENARIO (AOS) NO:

DESCRIBE PROCESS: Ground yard and wood waste is anaerobically digested to produce biogas which is sold to an off-site industrial user or combusted in a candle flare (CD-2).

OPERATION DATE: September 1, 1999

SEASONAL VARIATION (%)	JAN-MAR 25	APR-JUN: 25	JUL-SEP: 25	OCT-DEC: 25

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS			
TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Yard and wood waste / water slurry	gallons	2,300 gallons / hour	2,300 gallons / hour

MATERIALS ENTERING PROCESS - BATCH OPERATION			
TYPE	UNITS	MAX. DESIGN CAPACITY (UNIT/BATCH)	REQUESTED CAPACITY LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN CAPACITY (BATCHES/YR):	MAXIMUM DESIGN CAPACITY (BATCHES/HR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	MAX. CAPACITY ANNUAL FUEL USE:

DESCRIBE ANY MONITORING DEVICES, GAUGES, OR TEST PORTS: The flare station and digester control panels will provide temperature and pressure readings. Monitoring ports will be installed at various locations throughout the system to measure gas quality and flow as well as digester performance.

INDICATE ALL REQUESTED STATE AND FEDERALLY ENFORCEABLE PERMIT LIMITS (e.g., hours of operation, material input rates, emission rates, etc.) AND DESCRIBE HOW THESE LIMITS ARE MONITORED AND WITH WHAT FREQUENCY.

COMMENTS: 1. The operation date indicates the anticipated start-up for the digester system.

2. The maximum design capacity is based on the volume of the day tank (55,000 gallons) and a 24 hour day.

3. The requested capacity limitation has been set equal to maximum design capacity to account for fluctuations in the anaerobic digestion process.

SECTION C
CONTROL DEVICE (GENERAL)

C1

REVISED 04/15/94

AIR QUALITY SECTION

CONTROL DEVICE ID NO: CD-2	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ES-6
EMISSION POINT ID NO(S): EP-3	*POSITION IN SERIES OF CONTROLS* NO. 1 OF 1 UNITS
MANUFACTURER: LFG Specialties, Inc.	MODEL NO: T-PCF61816 6-inch Utility Flare
ALTERNATIVE OPERATING SCENARIOS (AOS) NO:	

DESCRIBE CONTROL SYSTEM: Collection piping from the 3 anaerobic digesters and the preparatory tank are connected to a utility flare where the biogas is combusted at a 98 percent destruction efficiency, as stated by the manufacturer. The collection efficiency is assumed to be 100 percent of biogas generation.

POLLUTANT(S) COLLECTED:		VOC	HAP		
CORRESPONDING EFFICIENCY:		100 %	100 %	%	%
EFFICIENCY DETERMINATION CODE:	*	4	4		
BEFORE CONTROL EMISSION RATE (LB/HR):	**	2.3 x 10^-3	2.3 x 10^-3		
AFTER CONTROL EMISSION RATE (LB/HR):	***	4.6 x 10^-5	4.6 x 10^-5		

PRESSURE DROP (IN. H20) MIN 0 MAX 5	
INLET TEMERATURE (F): MIN 50 MAX 100	OUTLET TEMPERATURE (F): MIN 110 MA 1600
INLET AIR FLOW RATE (ACFM):	OUTLET AIR FLOW RATE (ACFM): 2,337
INLET AIR FLOW VELOCITY (FT/SEC):	OUTLET AIR FLOW VELOCITY (FT/SEC): 198
INLET MOISTURE CONTENT (%): Approx. 7 percent	
COLLECTION SURFACE AREA (FT2): Digesters	FUEL USED: N/A — FUEL USAGE RATE: N/A

DESCRIBE STARTUP PROCEDURES:

A propane gas pilot system provides fuel to the flare while an electric ignitor provides the initial combustion source needed to ignite the burner unit. LFG is then routed to the flare, providing continuous combustion.

DESCRIBE MAINTENANCE PROCEDURES:

The utility flare will be maintained in accordance with the manufacturer's specifications.

DESCRIBE ANY AUXILARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

A control panel provides temperature gauges. Monitoring ports will be installed in order to obtain gas quality, pressure, and flow measurements.

SHOW BY DIAGRAM THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

See Appendix B

ATTACH MANUFACTURER'S SPECIFICATIONS, SCHEMATICS, AND ALL OTHER DRAWINGS NECESSARY TO DESCRIBE THIS CONTROL DEVICE AND ITS RELATIONSHIP TO ITS EMISSION SOURCE.

COMMENT N/A: Not Applicable

* Collection piping is assumed to collect 100 percent of the generated biogas.

** Values represent potential emissions from the anaerobic digesters before flaring.

*** Values represent potential emissions from the flare.

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION:	Anaerobic Digester Facility
EMISSION SOURCE ID NO: ES-6	IS THIS SOURCE A FUGITIVE SOURCE? ( ) YES (X) NO
ALTERNATIVE OPERATING SCENARIO (AOS) NO:	

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
VOC	1	4.6 x 10^-5	4.6 x 10^-5	0.4	0.4
HAP	1	4.6 x 10^-5	4.6 x 10^-5	0.4	0.4

COMMENTS:

1. As a worst case scenario, actual emissions were set equal to potential emissions.

SECTION A

EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS **A5**

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE ID NO ES-7	
CONTROL DEVICE ID NO:	

PRIMARY OPERATING SCENARIO (DESCRIBE):

A 10,000 gallon unleaded gasoline storage tank (ES-7) stores fuel for site vehicles and machinery used in the daily operation of the MSW Landfill. See Emissions Inventory, Section 7 of Division D.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION:	Unleaded Gasoline Storage Tank		
EMISSION SOURCE ID NO:	ES-7	IS THIS SOURCE A FUGITIVE SOURCE?	( ) YES (X) NO
ALTERNATIVE OPERATING SCENARIO (AOS) NO:			

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
VOC	3	0.02	0.02	194.5	194.5
HAP	3	0.02	0.02	194.5	194.5

COMMENTS:

1. As a worst case scenario, actual emissions were set equal to potential emissions.

SECTION A

EMISSION SOURCE/CONTROL DEVICE ALTERNATIVE OPERATING SCENARIOS **A5**

REVISED 04/15/94 **AIR QUALITY SECTION**

EMISSION SOURCE ID NO ES-8

CONTROL DEVICE ID NO:

PRIMARY OPERATING SCENARIO (DESCRIBE):

A 20,000 gallon diesel fuel storage tank (ES-8) stores fuel for site vehicles and machinery used in the daily operation of the MSW Landfill. See Emissions Inventory, Section 7 of Division D.

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

DESCRIBE ALTERNATIVE OPERATING SCENARIO (AOS) NO. _____, (specify no.):

COMMENTS:

SECTION D

SPECIFIC EMISSION SOURCE (EMISSION INFORMATION)

D3-1

(*see note in instructions concerning state air toxics regulations)

REVISED 04/15/94

AIR QUALITY SECTION

EMISSION SOURCE DESCRIPTION:	Diesel Fuel Storage Tank	
EMISSION SOURCE ID NO: ES-8	IS THIS SOURCE A FUGITIVE SOURCE? ( ) YES (X) NO	
ALTERNATIVE OPERATING SCENARIO (AOS) NO:		

POLLUTANT	EMISSION FACTOR TYPE	EMISSION RATE IN LBS/HR		EMISSION RATE IN LBS/YR	
		POTENTIAL	ACTUAL	POTENTIAL	ACTUAL
VOC	3	5.85 x 10^-4	5.85 x 10^-4	5.1	5.1
HAP	3	5.85 x 10^-4	5.85 x 10^-4	5.1	5.1

COMMENTS:

1. As a worst case scenario, actual emissions were set equal to potential emissions.

SECTION D

EMISSION POINT SUMMARY

D4

REVISED 04/15/94

AIR QUALITY SECTION

LIST ALL INFORMATION ASSOCIATED WITH EACH EMISSION POINT

EMISSION POINT ID NO.	EMISSION POINT HEIGHT (FT)	EQUIV. DIAM. (FT)	TEMP. (F)	VELOCITY (FT/SEC)	FLOW RATE (ACFM)	EMISSION POINT DIRECTION	RAIN CAP? (Y OR N)
EP-1	33	1.2	1600	175	75,000	V	N
EP-2	6	0.7	N/A	N/A	N/A	H	N
EP-3	25	0.5	1600	125	60,000	V	N
EP-4	0	N/A	N/A	N/A	N/A	N/A	N/A

COMMENTS:

N/A These specifications were unavailable from the manufacturer.

SECTION D
FACILITY EMISSIONS SUMMARY

D5

AIR QUALITY SECTION

REVISED 04/15/ *TOTAL FROM SPECIFIC EMISSION SOURCE SUMMARIES*

POLLUTANT	CAS NO.	ANNUAL EMISSIONS IN LBS/YR	
		ACTUAL	POTENTIAL
PM-10		5,000	16,600
SO2		20,000	40,600
NOx		65,000	139,000
CO		104,400	358,600
VOC		5,400	6,400
HAPs		6,000	6,200
NMOC		9,600	9,600

TOTAL FACILITY FIRING RATE FOR FOSSIL AND WOOD-FIRED BURNERS: ______ MILLION BTU/HR

TOTAL REACTIVE VOC's FROM THE FACILITY: ______ LBS/DAY or ______ % Total Control or OTHER (specify) see above information

COMMENTS:

1. The VOC represent 39 percent of NMOC generation. Potential NMOC emissions were obtained using the year 2003 estimates. Actual NMOC emissions were obtained using an average NMOC rate over 5 years.

2. PM-10 emissions were limited to those emitted from the flares and tub grinder.

ATTACH TO THIS APPLICATION

1. All calculations showing the use of emission factors, material balances, and/or other methods from which the pollutant emission rates in this application were derived. Include calculations of potential emissions before and, where applicable, after control. Clearly state any assumptions made and provide any references as needed to support the calculations.
2. An engineering evaluation with supporting references for any control efficiences listed on Forms C. Include pertinent operating parameters (typical operating conditions, manufacturer's recommendations, and parameters as applied for in this application) critical to ensuring proper performance of the control device(s).

PROFESSIONAL ENGINEERING SEAL

Pursuant to 15A NCAC 2Q .0112 "Applications Requiring Professional Engineering Seal," a professional engineer registered in North Carolina shall be required to seal technical portions of this application for new sources and modifications of existing sources that involve:

1. design,
2. determination of applicability and appropriateness, or
3. determination and interpretation of performance, of air pollution capture and control systems.

Applications for the following do not require a Professional Engineering Seal:

1. any source with non-optional control equipment that constitutes an integral part of the process equipment designed and manufactured by the equipment supplier,
2. sources which are permitted by a general permit under 15A NCAC 2Q .0310 or .0509
3. paint spray booths without air pollution capture and control systems for volatile organic compound emissions,
4. a particulate emission source if total air flow rate from the particulate emission source after control is less than or equal to 10,000 actual cubic feet per minute,
5. nonmetallic mineral processing plants with wet suppression control systems for particulate emissions,
6. permit renewal with no modifications.

REGISTERED PROFESSIONAL ENGINEER:

The analyses contained in the application and attachments were by me or under my 'Responsible Charge'

DATE: 11-10-99

NAME: ERIC R. PETERSON

COMPANY: SCS ENGINEERS, P.C.,

ADDRESS: 218 E. TREMONT AVE., SUITE C
CHARLOTTE, NC 28203-5364

TELEPHONE: (704) 377-4766

SIGNATURE: Eric Peterson

PLACE NORTH CAROLINA SEAL HERE

NORTH CAROLINA PROFESSIONAL SEAL 025198 ENGINEER ERIC R. PETERSON

FOR PAGE * THROUGH *

* FOR PERMIT APPLICATION

SECTION E
TITLE V INFORMATION

E1

REVISED 04/15/94

AIR QUALITY SECTION

IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL SUBSEQUENT "E" FORMS (E2 THROUGH E6).

*** NOT APPLICABLE ***

INDICATE HERE IF YOUR FACILITY IS MAJOR FOR TITLE V BY ( ) CATEGORY OR ( ) EMISSION LEVEL.

IF MAJOR FOR CATEGORY, INDICATE THE CATEGORY: ______________________

IF MAJOR BY EMISSION LEVEL, COMPLETE THE FOLLOWING:

POLLUTANT(S) FOR WHICH THE FACILITY IS MAJOR	EMISSION RATE (SPECIFY UNITS)

ARE YOU SUBJECT TO ANY CURRENT MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY STANDARDS (MACTs) OR FUTURE MACTs. IF SO, SPECIFY: ______________________

____

LIST ANY ADDITIONAL REGULATIONS WHICH ARE REQUESTED TO BE INCLUDED IN THE PERMIT SHIELD AND PROVIDE AN EXPLANATION FOR THE REQUESTED SHIELD:

REGULATION	EXPLANATION

SECTION E
TITLE V INSIGNIFICANT ACTIVITIES SUMMARY

E2

REVISED 04/15/94

AIR QUALITY SECTION

INSIGNIFICANT ACTIVITIES PER TITLE 15A NCAC 2Q .0507(b)			
DESCRIPTION OF EMISSION SOURCE		UNITS (tpy)	BASIS FOR EXEMPTION (REF. 15A NCAC 2Q .0507(b))
1. Leachate Management	VOC	5.2 x 10^-4	2 Q.0102(b)(2)(E)(i)
	HAP	5.2 x 10^-4	2 Q.0102(b)(2)(E)(i)
2. Anaerobic Compost Digesters	VOC	1.2 x 10^-3	2 Q.0102(b)(2)(E)(i)
	HAP	1.2 x 10^-3	2 Q.0102(b)(2)(E)(i)
3 Diesel Fuel Storage Tank	VOC	3.0 x 10^-3	2 Q.0102(b)(1)(D)(i)
	HAP	3.0 x 10^-3	2 Q.0102(b)(1)(D)(i)

REQUEST FOR INSIGNIFICANT ACTIVITIES PER TITLE 15A NCAC 2Q .0508(aa)		
DESCRIPTION OF EMISSION SOURCE	UNITS	BASIS FOR EXEMPTION (SEE INSTRUCTIONS)

COMMENTS 1. To be conservative, VOCs set equal to HAPs.

2. Units based on potential to emit.

3.. The emissions from the anaerobic compost digester are potential emissions from the digester assuming zero biogas collection. These emissions do not include the candle flare (CD-2).

SECTION E

EMISSION SOURCE LISTING (INITIAL/RENEWAL TITLE V FACILITY)

E3

REVISED 01/15/99 | **AIR QUALITY SECTION** | DO NOT COMPLETE FORM A4

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION	EMISSION POINT ID NO. or "FUGITIVE"
ES-1	Closed MSW LF Cell	CD-1	Candlestick Flare	EP-1
ES-2	Closed MSW LF Cell	CD-1	Candlestick Flare	EP-1
ES-3	Active MSW LF Cell	CD-1	Candlestick Flare	EP-1
ES-4	Tub Grinder			EP-2
ES-5	Leachate Management			Insignificant
ES-6	Anaerobic Compost Digester	CD-2	Candlestick Flare	EP-3
ES-7	Unleaded Gasoline Stor. Tank			EP-4
ES-8	Diesel Fuel Storage Tank			Insignificant

112(r) APPLICABILITY INFORMATION:

IS YOUR FACILITY SUBJECT TO 40 CFR PART 68 "PREVENTION OF ACCIDENTAL RELEASES" - SECTION 112(r) OF THE FEDERAL CLEAN AIR ACT? YES ______ NO ______

IF NO, PLEASE SPECIFY IN DETAIL HOW YOUR FACILITY AVOIDED APPLICABILITY: ______

IF YOUR FACILITY IS SUBJECT TO 112(r), PLEASE COMPLETE THE FOLLOWING:

A. HAVE YOU ALREADY SUBMITTED A RISK MANAGEMENT PLAN (RMP) TO EPA PURSUANT TO 40 CFR PART 68.10 OR PART 68.150?

YES ______ NO ______ SPECIFY REQUIRED RMP SUBMITTAL DATE: ______

B. ARE YOU USING ADMINISTRATIVE CONTROLS TO SUBJECT YOUR FACILITY TO A LESSER 112(r) PROGRAM STANDARD?

YES ______ NO ______ IF YES, PLEASE SPECIFY: ______

SECTION E
TITLE V COMPLIANCE CERTIFICATION

E5

REVISED 04/15/94

AIR QUALITY SECTION

In accordance with the provisions of Title 15A NCAC 2Q .0520 the responsible company official of:

(COMPANY NAME)	City of Greensboro
(COMPANY ADDRESS)	P.O. Box 3136
(CITY, NC)	Greensboro , NC 27402-3136
(COUNTY)	Guilford
(PERMIT NUMBER)	41-03

certifies that:

1. for applicable requirements with which the facility is in compliance, the facility shall continue to comply with such requirements;

2. for applicable requirements that will become effective during the permit term, the facility shall comply with such requirements;

3. for applicable requirements for which the facility is not in compliance at the time of permit issuance, a narrative description of how the equipment will achieve compliance with the applicable requirements has been submitted to the North Carolina Division of Environmental Management; and

4. the facility shall fulfill applicable enhanced monitoring requirments and submit a compliance certification as required by the EPA and 40 CFR Part 64.

Schedule for Submission of Compliance Certifications During the Term of the

Frequency of Submittal __Annually__ Beginning ____ / ____ / ____

The undersigned certifies under the penalty of law that all information and statements provided in the application, based on the information and belief formed after reasonable inquiry, are true, accurate, and complete.

______________________________ date ________

Signature of responsible company official

Jeryl W. Covington, Technical and Planning Support Manager

Name, Title of responsible company official (Type or print)

COMPLIANCE STATUS WITH RESPECT TO ALL APPLICABLE REQUIREMENTS:

Will each emission source at your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements? (X) YES ( ) NO

(If no complete a through f below for each requirement for which compliance is not achieved.)

Will your facility be in compliance with all applicable requirements taking effect during the term of the permit and meet such requirements on a timely basis? (X) YES ( ) NO

(If no complete a through f below for each requirement for which compliance is not achieved.)

a. Identify emission source ID No. ______________________

b. Identify applicable requirement for which compliance is not achieved:

c. Narrative description of how compliance will be achieved with this applicable requirements:

d. Detailed Schedule of Compliance:

Step(s)	Date Expected

e. Frequency for submittal of progress reports (6 month minimum) ____________

f. Starting date for submittal of progress reports _____ / _____ / _____

DIVISION C

EXEMPT ACTIVITIES CHECKLIST

Checkoff List of Emissions Units and Activities Exempt from the Part 70 Permit Application

Place a check mark beside each type of emissions unit or activity which is located at the facility. Where noted, indicate the number of that type of emissions unit or activity located at the facility.

X	(1)	Machinery or equipment that normally is used in a mobile manner;
______	(2)	Boiler(s) used exclusively to operate steam engines for farm and domestic use;
______	(3)	Actual construction of buildings, apart from possible emission-producing machinery housed in the buildings;
______	(4)	Parking garage(s);
X	(5)	Parking lot(s);
X	(6)	Motor vehicles, steamships, tugs, and railroad locomotives;
No. 1	(7)	Fuel-burning equipment using gaseous fuels or No. 1 or No. 2 fuel oil with a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;
No.____	(8)	Fuel-burning equipment using solid fuel with a heat input of less than 350,000 Btu (0.37 gigajoule) per hour;
No.____	(9)	Stationary internal combustion engines with less than 1,000 brake horsepower (1,014 metric horsepower);
______	(10)	Bench scale laboratory equipment used exclusively for chemical or physical analysis or experimentation;
X	(11)	Portable brazing, soldering, or welding equipment;
X	(12)	Comfort air conditioning or comfort ventilating systems which are not designed to remove emissions generated by or released from specific units of equipment;
______	(13)	Water cooling towers and water cooling ponds unless used for evaporative cooling of water from barometric jets or barometric condensers, or used in conjunction with an installation requiring a permit to operate;
______	(14)	Equipment used exclusively for steam cleaning;
______	(15)	Grain, metal, plastic, or mineral extrusion press;
______	(16)	Porcelain enameling drying ovens;
No.____	(17)	Unheated VOC dispensing containers or unheated VOC rinsing containers of 60 gallons (227 liters) capacity or less;
______	(18)	Equipment used for hydraulic or hydrostatic testing;
______	(19)	Blast cleaning equipment using a suspension of abrasive in water;
______	(20)	Bakery ovens where the products are edible and intended for

human consumption;

______ (21) Kilns used for firing ceramic ware, heated exclusively by natural gas, liquefied petroleum gas, electricity, or any combination of these;

______ (22) Confection cookers where the products are edible and intended for human consumption;

______ (23) Drop hammers or hydraulic presses for forging or metal working;

______ (24) Die casting machines;

______ (25) Photographic process equipment used to reproduce an image upon sensitized material through the use of radiant energy;

______ (26) Equipment for drilling, carving, cutting, routing, turning, sawing, planing, spindle sanding, or disc sanding of wood or wood products;

______ (27) Equipment for surface preparation of metals by use of aqueous solutions, except for acid solutions;

______ (28) Equipment for washing or drying products fabricated from metal or glass, provided that no VOC is used in the process and that no oil or solid fuel is burned;

______ (29) Laundry dryers, extractors, or tumblers for fabrics cleaned with only water solution or bleach or detergents;

______ (30) Containers, reservoirs, or tanks used exclusively for electrolytic plating work, or electrolytic polishing, or electrolytic stripping of brass, bronze, cadmium, copper, iron, lead, nickel, tin, zinc, and precious metals;

______ (31) Natural draft hoods or natural draft ventilators;

Containers, reservoirs, or tanks used exclusively for:

______ (32) Dipping operations for coating objects with oils, waxes, or greases, where no VOC is used;

______ (33) Dipping operations for applying coatings of natural or synthetic resins which contain no VOC;

__X__ (34) Storage of butane, propane, or liquefied petroleum, or natural gas;

__X__ (35) Storage of lubricating oils;

No.______ (36) Unheated storage of VOC with an initial boiling point of 300°F (149°C) or greater;

__X__ (37) Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel;

No.__2__ (38) Storage of motor vehicle gasoline, having an individual tank capacity in Areas I, II, V, VI of less than 25,000 gallons (94.6 cubic meters) and in Areas III, IV of less than 250 gallons (0.9 cubic meter);

No.__4__ (39) The storage of VOC normally used as solvents, diluents, thinners, inks, colorants, paints, lacquers, enamels, varnishes, liquid resins, or other surface coatings and having a capacity of 2.000 gallons (7.6 cubic meters) or less;

______ (40) Gaseous fuel-fired or electrically heated furnaces for heat treating glass or metals, the use of which does not involve molten materials;

Crucible furnaces, pot furnaces, or induction furnaces, with a capacity of 1,000 pounds (454 kilograms) or less each, in which no sweating or distilling is conducted, or any fluxing conducted, using chloride, fluoride, or ammonium compounds and from which only the following metals are poured or in which only the following metals are held in a molten state:

_______ (41) Aluminum or any alloy containing over 50 percent aluminum, if no gaseous chloride compounds, chlorine, aluminum chloride, or aluminum fluoride is used;

_______ (42) Magnesium or any alloy containing over 50 percent magnesium;

_______ (43) Lead or any alloy containing over 50 percent lead;

_______ (44) Tin or any alloy containing over 50 percent tin;

_______ (45) Zinc or any alloy containing over 50 percent zinc;

_______ (46) Copper;

_______ (47) Precious metals;

_______ (48) Vacuum cleaning systems used exclusively for industrial, commercial, or residential house-keeping purposes;

_______ (49) Charbroilers and pit barbecues as defined in COMAR 26.11.18.01 with a total cooking area of 5 square feet (0.46 square meter) or less;

Any of the following activities or equipment used in support of a manufacturing or production process:

___X___ (50) Office and clerical equipment, implements, and activities such as typewriters, printers, copy machines, and pens;

___X___ (51) Interior maintenance activities and equipment, such as janitorial cleaning products and air fresheners, except for cleaning of manufacturing and production equipment;

___X___ (52) Architectural and exterior maintenance activities conducted to take care of the buildings and grounds, such as painting buildings, tarring roofs, sandblasting of exterior building surfaces before repainting, and lawn maintenance;

___X___ (53) Bathroom and locker room ventilation and maintenance;

X (54) Activities of maintenance shops, such as welding, gluing, and soldering, except for sources required to obtain a permit to construct under COMAR 26.11.02.09A;

___ (55) First aid and emergency medical care provided at the facility, including related activities such as sterilization and medicine preparation;

___ (56) Food preparation and cooking equipment used to service facility kitchens, dining rooms, and other eating areas;

X (57) Space heaters operating by direct heat transfer and used solely for comfort heat;

X (58) A consumer product used in the same manner as in normal consumer use;

X (59) Safety devices and fire-fighting equipment, such as fire extinguisher, except sources of continuous emissions;

___ (60) Emergency flares used to indicate danger to workers or to the public;

X (61) Trees, shrubbery, and other flora;

___ (62) Certain recreational equipment and activities, such as fireplaces, barbecue pits and cookers, fireworks displays, and kerosene fuel use;

X (63) Stacks and vents from plumbing traps used to prevent the discharge of sewer gases handling domestic sewage only, except those at wastewater treatment plants or those on systems handling industrial waste;

X (64) Potable water treatment equipment, not including air stripping equipment;

___ (65) Noncontact water (i.e, water that has not been in direct contact with process fluids) cooling towers except as regulated under Section 112 of the Clean Air Act;

___ (66) Firing and testing of military weapons and explosives;

___ (67) Emissions resulting from the use of explosives for blasting at quarrying operations and from the required disposal of boxes used to ship the explosive;

Any other emissions unit, not listed in this section, with a potential-to-emit before control not greater than:

No.___ (68) 0.23 pound in any hour and 1 ton per year of particulate matter emissions, PM_{10} emissions, sulfur oxides, oxides of nitrogen, or volatile organic compounds; or

No.___ (69) 10 tons per year of carbon monoxide;

___ (70) Tobacco smoking rooms and areas;

___ (71) Blacksmith forges;

X (72) Portable electrical generators that can be moved by hand from one location to another;

X (73) Air compressors and pneumatically operated equipment, including hand tools;

X	(74)	Batteries and battery charging stations, except at battery manufacturing plants;
	(75)	Storage tanks, reservoirs, and pumping and handling equipment, of any size containing nonvolatile aqueous salt solutions;
	(76)	Equipment used to mix and package, soaps, vegetable oils, grease, animal fat, and nonvolatile aqueous salt solutions;
	(77)	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities;
	(78)	Environmental chambers not using hazardous air pollutant (HAP) gasses;
	(79)	Shock chambers;
	(80)	Humidity chambers;
	(81)	Solar simulators;
	(82)	Process water filtration systems and demineralizers;
	(83)	Demineralized water tanks and demineralizer vents;
	(84)	Boiler water treatment operations, not including cooling towers;
	(85)	Oxygen scavenging (de-aeration) of water;
	(86)	Ozone generators; and
X	(87)	Any other emissions unit that is not subject to an applicable requirement of the Clean Air Act.

DIVISION D

FACILITY-WIDE EMISSIONS INVENTORY

TABLE OF CONTENTS

FACILITY-WIDE EMISSIONS INVENTORY
WHITE STREET LANDFILL

SECTION 1

INTRODUCTION

SITE BACKGROUND

The White Street Landfill (Landfill) (Solid Waste Permit No. 41-03) encompasses an area of approximately 767 acres within the city limits in the northeast quadrant of the City of Greensboro (City), at the east end of White Street. The Landfill is used for the disposal of MSW generated within the City and Guilford County. Additionally, the facility has a yard waste and anaerobic digestion area, a daily cover borrow area, and a closed construction and demolition (C&D) area. Beginning in 1943, waste disposal at the Landfill consisted primarily of incineration. Burning operations ceased in 1965, and since that time refuse has been buried on site.

The Landfill is divided into three Phases (Figure 1A). Phase I is an unlined, 85 acre cell containing approximately 2.72 million tons of waste. The City began filling Phase I in 1965 and ceased adding waste just prior to 1978. Phase II is an unlined, 120 acre site containing approximately 5.5 million tons of refuse. Phase II was utilized from 1978 to 1998. Both Phase I and Phase II are capped with a minimum of two feet of clay soil.

The current fill area, Phase III, is a Subtitle D lined unit of approximately 51 acres with a design capacity of 4.2 million tons. Phase III is sub-divided into three cells of approximately 25, 14, and 12 acres and contains a leachate collection system.

A landfill gas (LFG) collection system has been installed in Phase II and is currently directing LFG to be utilized in a landfill gas-to-energy (LFGTE) project, supplying LFG to Cone Mills Corporation for use as boiler fuel. During maintenance and scheduled off-times at Cone Mills, the LFG is destroyed in an on-site utility flare. Collection piping will be installed in Phase III but will not be activated until a future date.

An anaerobic digestion system is presently being installed near Phase III to digest wood and yard wastes with the intent of producing and collecting biogas for off-site sale. Current plans call for the biogas to be piped with the Landfill LFG to Cone Mills. As with the LFG, the biogas will be destroyed in a separate utility flare when not sold. Wood wastes and yard material not utilized by the digester will be set aside and used as mulch for on-site or City projects.

GENERAL

The emissions inventory presented herein is the basis for the emissions values reported in the Part 70 (Title V) Operating Permit application. The emissions sources identified were based on SCS Engineer's knowledge of the site, discussions and correspondence with Landfill staff and Duke Engineering and Services (DE&S), and review of existing permits, waste tonnages, and other information provided by the City.

This section of the emission inventory lists the emission sources at the Landfill and describes the characteristics of the emissions to the extent necessary to establish

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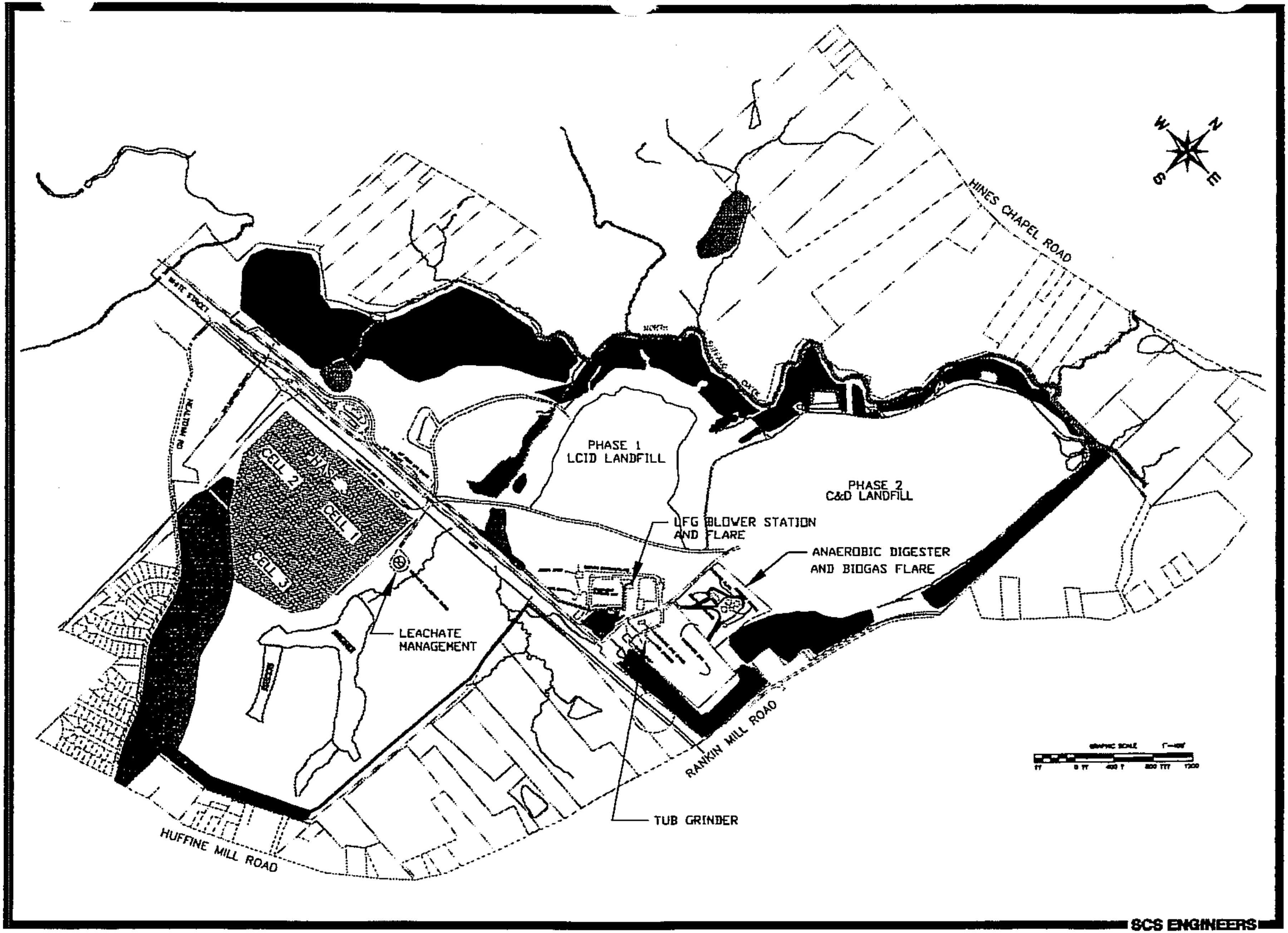


FIGURE 1A. WHITE STREET LANDFILL SITE PLAN

applicable requirements. Generally, all air pollutant emissions (regardless of whether the source is regulated for that pollutant emission) are calculated for a source. This is completed in order to provide a detailed emissions inventory for the site. The emission sources described in the permit application are repeated here in Table 1A. The emissions inventory focuses on sources for which there are applicable federal or state air pollution regulations.

The *Potential-to-Emit* (PTE) annual emission rates for each of these sources are summarized in Table 1B. The calculation of PTE emissions assumes the sources operate at their maximum capacities, unless otherwise noted. Table 1C summarizes the actual emissions of these sources, which takes into consideration the actual day-to-day operating parameters of the emission units.

TABLE 1A. SUMMARY OF EMISSION SOURCES

Source Number	Designation	Unit Type
ES-1	Closed MSW Landfill Permit No. 41-03 (Phase I)	Non-Source Fugitive
ES-2	Closed MSW Landfill Permit No. 41-03 (Phase II)	Non-Source Fugitive
ES-3	Active MSW Landfill Permit No. 41-03 (Phase III)	Non-Source Fugitive
ES-4	Tub Grinder	Non-Fugitive / Significant
ES-5	Leachate Management	Wastewater / Insignificant
ES-6	Anaerobic Digestion Facility	Non-Fugitive / Insignificant
ES-7	Unleaded Gasoline Storage Tank	Non-Fugitive / Significant
ES-8	Diesel Fuel Storage Tank	Non-Fugitive / Insignificant
CD-1	Landfill Gas Collection System and Landfill Gas Flare	Flare / Control Device
CD-2	Anaerobic Digester Biogas Collection System and Biogas Flare	Flare / Control Device

----	Other Insignificant and Exempt Sources	Insignificant / Exempt Sources

TABLE 1B. PTE EMISSION RATE SUMMARY (tons/yr)

Source Number	Emission Source	VOCs	HAPs	NO_X	CO	NMOC	SO_X	PM-10
ES-1 + ES-2 + ES-3	Closed MSW Landfill [1] Phase I; Closed MSW Landfill [1] Phase II; Active MSW Landfill [1] Phase III	1.9 [2]	2.8 [3]	----	----	4.8	----	----
ES-4	Tub Grinder	1.1	0.05	38.2	8.8	----	12.9	0.64
ES-5	Leachate Management [5]	t	t	----	----	----	----	----
ES-6	Anaerobic Digester	0.01	0.01	----	----	----	----	----
ES-7	Unleaded Gas Tank	0.097	0.097	----	----	----	----	----
ES-8	Diesel Fuel Tank	t	t	----	----	----	----	----
CD-1	Landfill Gas Collection System and Flare [4]	0.11	0.17 [3]	25.0	136.1	----	4.4	6.1
CD-2	Anaerobic Biogas Collection System and Flare [4,5]	t	t	6.3	34.4	----	0.93	1.6
	Totals	3.2	3.1	69.5	179.3	4.8	18.2	8.3

---- Not Applicable
t Trace emission levels are those which equal less than 0.01 tons per year.
1 Worst case emissions during the permit period occur in the year 2003. The annual LFG generation estimates are summarized in Table 2C.
2 VOC generation is assumed to be 39 percent of the estimated NMOC generation. See Section 2 for an explanation of the model and parameters used to estimate emissions from the Landfill.
3 Values were obtained using AP-42, Section 2.4 guidance.
4 Flare PTE emission rates are based on the assumption that the flare operates at full capacity.
5 As a worst case scenario, HAPs have been assumed equal to VOCs in the leachate system and in the biogas from the anaerobic digester.

TABLE 1C. ACTUAL EMISSION RATE SUMMARY (tons/yr)

Source Number	Emission Source	VOCs	HAPs	NO_x	CO	NMOC	SO_x	PM-10
ES-1 + ES-2 + ES-3	Closed MSW Landfill [1] Phase I Closed MSW Landfill [1] Phase II Active MSW Landfill [1] Phase III	1.8 [2]	2.7 [3]	----	----	4.8	----	----
ES-4	Tub Grinder	0.7	0.03	23.9	5.5	----	8.0	0.4
ES-5	Leachate Management [5]	t	t	----	----	----	----	----
ES-6	Anaerobic Digester	0.01	0.01	----	----	----	----	----
ES-7	Unleaded Gas Tank	0.097	0.097	----	----	----	----	----
ES-8	Diesel Fuel Tank	t	t	----	----	----	----	----
CD-1	Landfill Gas Collection System and Flare [4]	0.11	0.17 [3]	6.9	37.3	----	1.6	1.7
CD-2	Anaerobic Biogas Collection System and Flare [4,5]	t	t	1.7	9.4	----	0.4	0.4
	Totals	2.7	3.0	32.5	52.2	4.8	10.0	2.5

---- Not Applicable
t Trace emission levels are those which equal less than 0.01 tons per year.
1 Emissions indicate the average over the permit period. The annual LFG generation estimates are summarized in Table 2C.
2 VOC generation is assumed to be 39 percent of the estimated NMOC generation. See Section 2 for an explanation of the model and parameters used to estimate emissions from the Landfill.
3 Values were obtained using AP-42, Section 2.4 guidance.
4 Flare PTE emission rates are based on the assumption that the flare operates at full capacity.
5 As a worst case scenario, HAPs have been assumed equal to VOCs in the leachate system and in the biogas from the anaerobic digester.

SECTION 2

UNCOLLECTED LANDFILL GAS FUGITIVES
(ES-1, ES-2, ES-3)

LANDFILL GAS FUGITIVE EMISSIONS

This section addresses the generation of non-methane organic compounds (NMOC) and volatile organic compounds (VOC), and their emissions via passive LFG releases. The potential (theoretical) LFG fugitive emissions for the life of the Title V operating permit are estimated in this section and presented below in Table 2A.

TABLE 2A. THEORETICAL POTENTIAL LANDFILL GAS FUGITIVE EMISSIONS

	Pollutant Emissions (tpy) [1]				
Compound	**1999**	**2000**	**2001**	**2002**	**2003**
VOC [2]	1.7	1.8	1.8	1.9	1.9
TOTAL HAPs [3]	2.6	2.6	2.7	2.7	2.8

1 Tons per year.
2 VOC generation is estimated to be 39 percent of NMOC generation per Table 2.4-2 of AP-42 Section 2.4 "Municipal Solid Waste Landfills," revised 11/98. These estimates assume an LFG collection efficiency of 75 percent.
3 HAP emissions based on AP-42, Section 4.2 guidance.

EMISSION RATE CALCULATIONS

NMOC generation from the Landfill operation was calculated using the *U.S. EPA Landfill Gas Emissions Model* (LandGEM). A description of the Model parameters is provided in this section and the model output is shown in Appendix C.

The LandGEM uses a first-order decay equation to predict landfill gas generation based on the amount and age of the waste-in-place. The methane generation potential, L_o, for the municipal solid waste (MSW) landfill cells (ES-1, ES-2, and ES-3) was set equal to 100.0 cubic meters (m^3) of methane (CH_4) per Megagram (Mg) of waste, and the methane generation rate constant, k, was set at 0.04 yr^{-1}. The values of L_o and k used were based on default values cited in AP-42 Section 2.4.4, *Municipal Solid Waste Landfills*, revised November 1998. The concentration of NMOC in LFG was input as 121 parts per million by volume (ppmv) as hexane based on the Method 25C sampling results for the site reported in the NSPS Tier 2 NMOC Report, dated 5/18/99.

The Tier 2 was performed to quantify the NMOC emissions at the Landfill for compliance with the New Source Performance Standards (NSPS), 40 CFR Part 60, Subpart WWW, promulgated on March 12, 1996. The basis for the NSPS legislation is EPA's determination that MSW landfills contribute significant amounts of air pollution that is potentially detrimental to public health. The NSPS are intended to control NMOC and methanogenic emissions from MSW landfills. NMOC's include VOCs, hazardous air pollutants (HAPs), and odorous compounds. The NSPS applies to landfills having a design capacity greater than 2.5 million Megagrams (Mg) (2.75 million tons), that were permitted, modified, or reconstructed after May 30, 1991.

Fill History

The filling history shown in Table 2B was input to the LandGEM. Note that this model estimates emissions based on the amount of waste-in-place at the beginning of each year.

Due to the unavailability of waste disposal records from 1965 to 1985, the annual waste receipts from 1965 to 1978 were estimated by a calculation based upon the total waste in-place at the closure of Phase I in 1978 (2.72 million tons) and the assumption of a 3.5% increase per year in waste disposal. The Landfill Manager, Frank Coggins, estimated the annual waste receipts into Phase II from 1978 to June 1985. Tipping scales were installed at the Landfill in 1985 and provided actual waste receipt data to the present date.

The Landfill currently has approximately 8.5 million tons of waste in-place, with sufficient air space, based upon current projections, to handle future waste receipts until January 1, 2008. The future waste projections were estimated by assuming a 5 % increase per year in waste disposal. The refuse filling history and future projections through the year 2008 are presented in Table 2B.

TABLE 2B. REFUSE FILL HISTORY AND PROJECTIONS

Year	Annual Refuse Acceptance Rate (tons)	Refuse In-Place on January 1 (tons)	Refuse In-Place on January 1 (Mg)
1965 (1)	186,275	0	0
1966 (1)	192,795	186,275	168,986
1967 (1)	199,542	379,070	343,887
1968 (1)	206,526	578,612	524,908
1969 (1)	213,755	785,138	712,265
1970 (1)	221,236	998,893	906,180
1971 (1)	228,980	1,220,129	1,106,882
1972 (1)	236,994	1,449,109	1,314,610
1973 (1)	245,289	1,686,103	1,529,607
1974 (1)	253,874	1,931,392	1,752,129
1975 (1)	262,759	2,185,266	1,982,440

1976 (1)	271,956	2,448,025	2,220,811
1977 (1)	281,474	2,719,981	2,467,525
1978 (2)	240,000	3,001,455	2,722,874
1979 (2)	240,000	3,241,455	2,940,599
1980 (2)	240,000	3,481,455	3,158,323
1981 (2)	240,000	3,721,455	3,376,047
1982 (2)	240,000	3,961,455	3,593,772
1983 (2)	240,000	4,201,455	3,811,496
1984 (2)	240,000	4,441,455	4,029,220
1985 (3)	239,000	4,681,455	4,246,945
1986	262,000	4,920,455	4,463,762
1987	292,000	5,182,455	4,701,444
1988	344,000	5,474,455	4,966,342
1989	342,000	5,818,455	5,278,414
1990	340,000	6,160,455	5,588,671
1991	331,000	6,500,455	5,897,114
1992	292,000	6,831,455	6,197,392
1993	236,000	7,123,455	6,462,290
1994	241,000	7,359,455	6,676,385
1995	253,050	7,600,455	6,895,017
1996	265,703	7,853,505	7,124,580
1997	278,988	8,119,208	7,365,622
1998	292,937	8,398,196	7,618,715
1999	307,584	8,691,133	7,884,463
2000 (4)	322,963	8,998,717	8,163,499
2001 (4)	339,111	9,321,680	8,456,486
2002 (4)	356,067	9,660,791	8,764,122
2003 (4)	373,870	10,016,858	9,087,141
2004 (4)	392,564	10,390,728	9,426,310
2005 (4)	412,192	10,783,292	9,782,438
2006 (4)	432,801	11,195,484	10,156,372
2007 (4)	454,441	11,628,285	10,549,003
2008 (4)	477,164	12,082,726	10,961,265

[1] Estimates fill rates based upon a 3.5% increase in waste receipts per year and in-place tonnages.

2007 [4]	454,441	11,628,285	10,549,003
2008 [4]	477,164	12,082,726	10,961,265

[1] Estimates fill rates based upon a 3.5% increase in waste receipts per year and in-place tonnages.
[2] Waste receipts estimated by the Landfill Manager.
[3] Tipping scales installed in June 1985.
[4] Estimates projected fill rates based upon a 5% increase in waste receipts per year.

NMOC Generation

The LandGEM predicts that the maximum NMOC generation rate at the site during the permit period will occur in the calendar year 2003, with the NMOC generation rate estimated at 17.2 Megagrams per year (Mg/yr) or 19 tons per year (tpy). NMOC generation typically increases for a number of years as waste is added and begins to decrease as the organic constituents volatilize and/or are degraded.

VOC Emissions

In determining the VOC emissions from the Landfill, the following is assumed:

1. Since site-specific data is not available, VOC generation is assumed to be 39 percent of the NMOC generation. This assumption is based on information contained in AP-42 Section 2.4 (revised November 1998) Table 2.4-2.

2. LFG is assumed to be collected and combusted at 75 percent of LFG generation, based on AP-42 guidance (2.4.4.2 – Controlled Emissions), for 1998 through 2003. Table 2C summarizes the expected LFG collection efficiencies.

TABLE 2C. LFG COLLECTION EFFICIENCY

Year	LFG Generation (cfm)	Estimated LFG Collected (cfm)	LFG Collection Efficiency [1] (%)
1998	2,400	1,800	75
1999	2,449	1,837	75
2000	2,503	1,877	75
2001	2,562	1,922	75
2002	2,627	1,970	75
2003	2,698	2,024	75

[1] An efficiency of 75 percent was estimated for the facility-wide LFG collection system.

Hazardous Air Pollutant (HAP) Emissions

The estimation of HAP and total reduced sulfur emissions from the Landfill are based on Equations (3) and (4) in AP-42 Section 2.4, and is presented below. The first step is to estimate the generation rate of the pollutant in cubic meters per year (m^3/yr). Next, the volumetric generation rate estimate is converted to a mass generation rate (tons per year).

$$Q_P\left(\frac{m^3}{yr}\right) = 1.82 \text{ x } Q_{CH_4} \frac{C_P}{10^6} \qquad (3)$$

where:

Q_p = Pollutant generation rate (m^3/yr)
Q_{CH4} = Methane generation rate (m^3/yr) from the LandGEM
Cp = Pollutant concentration in LFG (ppmv)
1.82 = Multiplication factor (assumes LFG is 55 percent methane, 45 percent carbon dioxide, nitrogen, etc.)

$$M_P\,(\text{tons/yr}) = Q_P\left[\frac{\left(\left(MW_P\,(g/gmol)\right)(1atm)\right)}{\left(\left(\left(8.205x10^{-5}\left(\frac{m^3-atm}{gmol-K}\right)\right)\left(\frac{1000\,g}{kg}\right)(273+T)K\right)\right)}\right]\left[\frac{ton}{907.185\,kg}\right] \qquad (4)$$

where:

M_p = Pollutant mass generation rate
MW_p = Molecular weight of pollutant (g/gmole)
T = Temperature of LFG (°C). (Assume standard temp. of 25 °C).

Table 2E summarizes pollutant concentrations and emission rates for typical HAPs in LFG. Appendix C includes a printout portion of a spreadsheet used to estimate total HAP emissions. The LFG collection system efficiency, 75 percent, and the utility flare HAP destruction efficiency, 98 percent, have been accounted for in the spreadsheet calculations.

TABLE 2E. LANDFILL HAP EMISSIONS

Pollutant	Mol. Wt. (g/gmole)	Concentration (ppmv) [1]	Fugitive HAP Emission Rates (tpy) [2] [3]
1,1,1-trichloroethane	133.41	0.48	0.03
1,1,2,2-tetrachloroethane	167.85	1.11	0.08
1,1-dichloroethane	98.97	2.35	0.10
1,1-dichloroethene	96.94	0.20	0.01
1,2-dichloroethane	98.96	0.41	0.02
1,2-dichloropropane	112.99	0.18	0.01
acrylonitrile	53.06	6.33	0.14
carbon disulfide	76.13	0.58	0.02
carbon tetrachloride	153.84	0.004	0.00
carbonyl sulfide	60.07	0.49	0.01
chlorobenzene	112.56	0.25	0.01
chloroethane	64.52	1.25	0.03
chloroform	119.39	0.03	0.00
dichlorobenzene	147.00	0.21	0.01
dichloromethane	84.94	14.30	0.50
ethylbenzene	106.16	4.61	0.20
ethylene dibromide	187.88	0.001	0.00
hexane	86.18	6.57	0.23
methyl ethyl ketone	72.11	7.09	0.21
methyl isobutyl ketone	100.16	1.87	0.08
perchloroethylene	165.83	3.73	0.25
trichloroethylene	131.40	2.82	0.15
vinyl chloride	62.50	7.34	0.19
xylenes	106.16	12.10	0.53
Total HAPs			2.81

[1] Since site specific data was not available, pollutant concentrations were taken from AP-42, Table 2.4-1, revised November 1998.

[2] The total HAP emission rates shown are for the Year 2003, the year when LFG and HAP generation are greatest over the five year life of the Title V permit.

[3] Represents the uncollected portion of HAPs generated by the Landfill, 25 percent of total generation.

Total Reduced Sulfur Emissions

Due to the unavailability of site-specific data, the assumed concentration of total reduced sulfur (TRS) compounds in LFG is 46.9 ppmv per AP-42 Section 2.4, revised November 1998. The shown below for estimating TRS emissions from the Landfill cells is taken from the above-referenced section of AP-42.

The volumetric generation rate of total reduced sulfur compounds is estimated by the following equation. Note that the methane flow rate from the Landfill cells (ES-1, ES-2, and ES-3) is equal to 1,349 scfm (2,698 scfm LFG) over the entire year during which LFG flow is greatest (i.e. year 2003). Since the LFG collection efficiency is assumed to be 75 percent, only fugitive emissions (25 percent of LFG generation) were used in these calculations.

The methane flow rate was converted from scfm to cubic meters per year:

$$\left(\frac{\text{m}^3\text{ of CH}_4}{\text{year}}\right)=\left(\frac{1{,}349\,\text{ft}^3}{\text{min}}\right)\left(\frac{2.8317\times10^{-2}\,\text{m}^3}{\text{ft}^3}\right)\left(\frac{60\,\text{min}}{\text{hour}}\right)\left(\frac{24\,\text{hours}}{\text{day}}\right)\left(\frac{365\,\text{days}}{\text{year}}\right)=2.007\times10^{7}\,\frac{\text{m}^3\text{ of CH}_4}{\text{year}}$$

The methane emissions are converted to sulfur emissions. This formula and the one below are explained in the HAP emissions section above.

$$\text{TRS}\left(\frac{\text{m}^3}{\text{yr}}\right)=(1.82)\left(2.007\times10^{7}\,\frac{\text{m}^3\text{ of CH}_4}{\text{year}}\right)\left(\frac{46.9}{10^6}\right)=1713.1\frac{\text{m}^3}{\text{year}}\text{ of S}$$

The "uncontrolled mass emissions" of total reduced sulfur compounds is calculated below:

$$\text{TRS}\left(\frac{\text{kg}}{\text{yr}}\right)=\left[\frac{1713.1\,\text{m}^3\,\text{S}}{\text{yr}}\right]\left[\frac{\left(32\dfrac{\text{g}}{\text{gmol}}\right)(1\text{atm})}{\left(\dfrac{8.205\times10^{-5}\,\text{m}^3-\text{atm}}{\text{gmol}-\text{K}}\right)\left(\dfrac{1000\text{g}}{\text{Kg}}\right)(298\text{K})}\right]$$

TRS = 2242 kg/yr = 2.47 tons/yr

Uncontrolled mass emissions = 25 percent of total = 0.62 tons/yr

SUMMARY

Table 2D summarizes the air pollutant generation and emission rates for NMOCs, VOCs, HAPs, and TRS. The LFG and NMOC generation rates were extracted from the generation by the percentage of *uncollected* LFG, which is assumed to be 25 percent. The TRS emissions were calculated based on the above formulas in this section.

TABLE 2D. AIR POLLUTANT GENERATION AND EMISSION RATES

Year	NMOC Generation (Mg/yr)	NMOC Generation (ton/yr)	Fugitive NMOC Emissions (ton/yr)	VOC Generation (ton/yr)	Fugitive VOC Emissions (ton/yr)	Fugitive HAP Emissions (ton/yr)	Fugitive TRS Emissions (tons/yr)
1999	15.4	17.0	4.3	6.6	1.7	2.6	0.56
2000	16.3	18.0	4.5	7.0	1.8	2.6	0.57
2001	16.3	18.0	4.5	7.0	1.8	2.7	0.59
2002	17.2	19.0	4.8	7.4	1.9	2.7	0.60
2003	17.2	19.0	4.8	7.4	1.9	2.8	0.62
AVG.		18.0	4.5	7.0	1.8	2.7	0.59

[1] VOC generation is assumed to be 39 percent of NMOC generation.
[2] Fugitive VOC emissions are based on fugitive LFG emissions of 25 percent of the total emissions.
[3] HAP emissions are based on AP-42, section 4.2 guidance. Fugitive HAP emissions are based on fugitive LFG emissions of 25 percent of total emissions.

SECTION 3

LANDFILL GAS FLARE
(CD-1)

GENERAL

The existing landfill gas (LFG) control system at the White Street Landfill commenced operation in December of 1986. The LFG system is comprised of approximately 90 vertical extraction wells, one condensate knockout trap, one utility (candle) flare, a blower and associated valves and piping. Vacuum is provided to the system by two Hoffman centrifugal blowers direct-coupled to a 125 hp TEFC motor.

The LFG is currently utilized in a waste-to-energy arrangement in which the LFG is piped to Cone Mills Corporation for fuel use in their boilers. During scheduled Cone Mills shutdowns and maintenance, the LFG is sent to the back-up utility flare. LFG Specialties, Inc. manufactured the 14-inch utility flare, which is equipped with a propane gas pilot system, electric spark igniter, and a wind shroud. The inlet flow design capacity of the flare is 2,800 scfm.

The potential emissions presented in this inventory and reported in the Part 70 permit application are based on the full-time operation of this flare; however, the flare's intended use is as back-up to the LFGTE recovery project.

FLARE EMISSIONS

The *Potential to Emit* (PTE) and actual flare emissions are calculated in this section. Potential emissions are calculated by assuming that the flare operates at its design capacity (i.e. 2,800 scfm) at a maximum operating duration of 24 hours a day for 365 days per year, or 8,760 hours per year. Actual emissions are calculated based on the assumption that excess LFG not utilized by the industrial end-user (i.e., Cone Mills Corporation) will be sent to the flare for combustion. The actual emissions represent the average expected flow to the flare over the life of the Part 70 operating permit (i.e. 2800 scfm), however, at a reduced operating duration of 2,400 hours per year, or 24 hours per day for 100 days per year.

The emission factors, potential emissions, and actual emissions are summarized in Table 3A.

TABLE 3A. COMBUSTED LFG EMISSIONS

Compound	LFG Flare Emission Factors	PTE LFG Flare Emissions (tpy)	Actual LFG Flare Emissions (tpy)
NO_X	0.068 lb/MMBtu [1]	25.0	6.9

CO	0.37 lb/MMBtu [1]	136.1	37.3
VOCs	98 % destruction [2]	0.11	0.11
PM-10	0.001 lb/hr cfm CH_4 [3]	6.1	1.7
SO_2	[4]	5.8	1.6
HAPs	98 % destruction [2]	0.17	0.17

1 NO_X and CO emission factors were obtained from "Landfill Gas Flare Emissions" by Louis Kalani and Ray Nardelli of LFG Specialties, Inc., presented at the SWANA 20th Annual Landfill Gas Symposium.
2 The VOC and HAP emission factors are the destruction efficiencies guaranteed by the flare manufacturer, LFG Specialties, Inc.
3 Emission factor obtained from AP-42, Section 4.2.
4 SO_2 emissions are based on an AP-42 concentration of 46.9 ppmv of TRS in LFG. See the Sulfur Dioxide Emissions section later in Section 3 of this emissions inventory for a detailed explanation.

Emission Rate Calculations

The LFG, for purposes of calculating the products of combustion and the associated emissions, is assumed to be 50 percent methane, 40 percent carbon dioxide, 9 percent nitrogen, and 1 percent oxygen. Concentrations of other LFG constituents are negligible with regard to the combustion process. The presence of nitrogen and oxygen in LFG is assumed due to the potential infiltration of ambient air into the gas extraction system through the surface of the landfill, with a portion of the oxygen being consumed in the aerobic degradation process. Trace LFG constituents make up less than 1 percent of the total gas volume. The flare operating data and emission calculations are presented in the following information.

TABLE 3B. LFG FLARE OPERATING DATA

Maximum firing rate of LFG	2,800 scfm [1]
Maximum hours of operation	8,760 hr/yr
Actual hours of operation [2]	2,400 hr/yr
Average Btu content of LFG [3]	500 Btu/scf

1 Standard cubic feet per minute (scfm).
2 Based on historical records and on-site operator estimates.
3 The Higher Heating Value of LFG based on a methane content of 50 percent is approximately 500 British Thermal Units (Btu) per standard cubic foot (scf) of gas.

POTENTIAL EMISSIONS

The estimated maximum potential emissions are calculated below for nitrogen oxides, carbon monoxide, VOC, and sulfur oxide emissions from the flares.

__PTE Heat Release (MMBtu/hr)__

The maximum heat release of the flare is calculated based on a heating value of approximately 500 Btu/scf.

$$(2800\ \text{scfm})\left(\frac{500\ \text{Btu}}{\text{scf}}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{1\ \text{MMBtu}}{10^{6}\ \text{Btu}}\right)$$

= __84.0 MMBtu/hr__

__Nitrogen Oxides and Carbon Monoxide Emission Rates__

The calculation of the potential nitrogen oxide (NO_X) and carbon monoxide (CO) emissions are based on the emission factors shown in Table 3A and the maximum firing rate of the flare (i.e. 2,800 scfm of LFG).

NO_X PTE Emissions-

$$\left(\frac{0.068\ \text{lb}\ NO_X}{\text{MMBtu}}\right)\left(\frac{84.0\ \text{MMBtu}}{\text{hr}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{yr}}\right)\left(\frac{1\ \text{ton}}{2000\ \text{lb}}\right)$$

= __25.0 tpy NO_X__

CO PTE Emissions-

$$\left(\frac{0.37\ \text{lb CO}}{\text{MMBtu}}\right)\left(\frac{84.0\ \text{MMBtu}}{\text{hr}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{yr}}\right)\left(\frac{1\ \text{ton}}{2000\ \text{lb}}\right)$$

= __136.1 tpy CO__

Particulate Matter PTE Emissions

$$\left(\frac{0.001\ \text{lb PM}-10}{\text{hr}-\text{cfm}\ CH_4}\right)(2{,}800\ \text{scfm LFG})\left(\frac{0.5\ \text{cfm}\ CH_4}{1\ \text{cfm LFG}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{year}}\right)\left(\frac{1\ \text{ton}}{2{,}000\ \text{lb}}\right)$$

Flare PM-10 = __6.1 tpy__

TABLE 3C. THEORETICAL POTENTIAL FLARE FUGITIVE EMISSIONS

Compound	Pollutant Emissions (tpy) [1]				
	1999	2000	2001	2002	2003
VOC [2] [4]	0.10	0.11	0.11	0.11	0.11
TOTAL HAPs [3] [4]	0.15	0.16	0.16	0.16	0.17

[1] Values represent emissions which have been collected but not combusted in the control device. Assumes all collected LFG from the Landfill is sent to be combusted in the flare.
[2] Calculations for fugitive VOC emissions from the flare are shown below.
[3] HAPs calculated based on AP-42, Section 4.2 guidance and is shown in Appendix D.
[4] Represents 75 percent collection efficiency by the LFG collection system and a 98 percent destruction efficiency by the utility flare (CD-1).

VOC PTE Flare Fugitive Emissions Calculation

Given:
NMOC Generation for 2003: 19.0 tons/year
75 percent LFG collection efficiency
VOCs = 39 percent of NMOCs
Flare destruction efficiency = 98 percent = 2 percent fugitive emissions

Therefore:
(NMOC Generation)*(LFG Collection Efficiency)*(VOCs 39 percent of NMOCs)*(1-Flare Destruction Efficiency of 98 percent)

(19.0 tpy)(0.75)(0.39)(0.02) = 0.11 tpy

Sulfur Dioxide PTE

The emissions of sulfur oxides, particularly sulfur dioxide (SO_2), from the flare is dependent on the inlet concentration of sulfur-bearing compounds in the LFG. The calculation of the estimated SO_2 emissions from the flare is based on the assumption that all of the sulfur-bearing compounds in the LFG are oxidized to SO_2. Since site specific data was not readily available, SO_2 emissions from the flare were estimated assuming the concentration of total reduced sulfur (TRS) compounds in LFG is 46.9 parts per million by volume (ppmv) as referenced in AP-42, Section 2.4, November 1998.

Molar Flow Rate of LFG to the Flares-

At a maximum volumetric flow rate of 2,800 scfm, the molar flow rate of LFG into the flare can be calculated as shown below. For this calculation, natural gas processing standards of 60° F (520° Rankine (R)) and 1 atmosphere have been used.

$$(2{,}800\ \text{scfm})\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{1\ \text{atm}}{\left(\frac{0.7302\ \text{atm ft}^3}{\text{lbmole R}}\right)(520^\circ\ \text{R})}\right)$$

= <u>442.4 lbmole fuel/hour</u>

SO_2 PTE Emissions-

Molecular weight of Sulfur (S) = 32.06 lb/lbmole

$$\left(\frac{46.9\ lbmole\ H_2S}{10^6\ lbmole\ fuel}\right)\left(\frac{442.4\ lbmole\ fuel}{hr}\right)\left(\frac{32.06\ lb\ SO_2}{lbmole\ H_2S}\right)\left(\frac{2\ lb\ SO_2}{lb\ S}\right)\left(\frac{1\ ton}{2{,}000\ lb}\right)\left(\frac{8{,}760\ hours}{yr}\right)$$

= <u>5.8 tpy SO_2</u>

<u>HAPs PTE</u>

These are shown in Table 3C. Refer to calculations in Appendix C for a detailed explanation.

ACTUAL EMISSIONS

The actual emissions for the LFG flare are calculated by using the same equations used for the calculation of potential emissions. The flare is currently operated at its maximum capacity of 2,800 scfm, however, in these calculations the operating duration is reduced from a maximum potential of 8,760 hours per year (365 days per year) to 2,400 hours per year (100 days per year). This reduced estimate was obtained from discussions with on-site flare station staff and includes estimated maintenance and regular downtime at the LFG industrial end-user. We believe this average will be conservative through the life of the Part 70 operating permit; however, an opportunity to provide actual flow values to the state will occur via annual emissions inventory reports.

The actual emissions for NO_X, CO, and SO_2 are calculated below:

<u>Actual Heat Release (MMBtu/hr)</u>

$$(2{,}800\ \text{scfm})\left(\frac{500\ \text{Btu}}{\text{scf}}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{1\ \text{MMBtu}}{10^6\ \text{Btu}}\right)$$

= <u>84.0 MMBtu/hr</u>

Actual Nitrogen Oxides Emissions

$$\left(\frac{0.068 \text{ lb } NO_X}{\text{MMBtu}}\right)\left(\frac{84.0 \text{ MMBtu}}{\text{hr}}\right)\left(\frac{2{,}400 \text{ hr}}{\text{yr}}\right)\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

= 6.9 tpy NO_X

Actual Carbon Monoxide Emissions

$$\left(\frac{0.37 \text{ lb CO}}{\text{MMBtu}}\right)\left(\frac{84.0 \text{ MMBtu}}{\text{hr}}\right)\left(\frac{2{,}400 \text{ hr}}{\text{yr}}\right)\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

= 37.3 tpy CO

Actual Sulfur Dioxide Emissions

The actual flare emissions of SO_2 are estimated using the same equations used for the PTE emissions estimate.

Actual Molar Flow Rate of LFG to the Flares-

$$\left(\frac{2{,}800 \text{ scf LFG}}{\text{min}}\right)\left(\frac{60 \text{ min}}{\text{hr}}\right)\left(\frac{1 \text{ atm}}{\left(\frac{0.7032 \text{ atm ft}^3 \left(520^\circ \text{ R}\right)}{\left(\text{lbmole R}\right)}\right)}\right)$$

= 459.4 lbmole fuel/hour

Actual SO_2 Emissions-

$$\left(\frac{46.9\ lbmole\ H_2S}{10^6\ lbmole\ fuel}\right)\left(\frac{459.4\ lbmole\ fuel}{hour}\right)\left(\frac{32.06\ lb\ S}{lbmole\ H_2S}\right)\left(\frac{2\ lb\ SO_2}{lb\ S}\right)\left(\frac{ton}{2{,}000\ lb}\right)\left(\frac{2{,}400\ hour}{year}\right)$$

= 1.6 tpy SO_2

Actual Particulate Matter Emisions

$$\left(\frac{0.001\ \text{lb PM}-10}{\text{hr}-\text{cfm CH}_4}\right)(2{,}800\ \text{scfm LFG})\left(\frac{0.5\ \text{cfm CH}_4}{1\ \text{cfm LFG}}\right)\left(\frac{2{,}400\ \text{hour}}{\text{year}}\right)\left(\frac{1\ \text{ton}}{2{,}000\ \text{lb}}\right)$$

Flare PM − 10 = 1.7 tpy

Actual VOC and HAP Emissions

To be conservative, the actual VOC and HAP emissions are assumed equal to the potential VOC and HAP emissions. These are shown in Table 3C.

SECTION 4

LEACHATE MANAGEMENT
(ES-5)

GENERAL

The following information represents the active MSW landfill cell, ES-3, which is lined and contains a Subtitle D compliant, leachate collection system. The presently closed MSW landfill cells, ES-1 and ES-2, are unlined and do not accommodate leachate collection, therefore are not considered in these calculations.

In cell ES-3, leachate generated by the buried waste materials is collected by the leachate collection system and gravity fed to a 365,000 gallon storage tank (Tank A) for pretreatment. Pretreatment in Tank A consists of ambient air injection and mechanical mixing. After pretreatment, the leachate is pumped to a second 365,000 gallon storage tank (Tank B) to await transport (via pipeline) to the local publicly owned treatment works (POTW) for processing and ultimate disposal. Both tanks are glass-lined, steel, cylindrical tanks with an enclosed rigid-roof and are approximately 24 feet high with a diameter of approximately 50 feet.

Due to the recent activation of cell ES-3, the annual leachate generation rate is presently 300,000 gallons per year. However, to be conservative and assuming future increased leachate generation, an assumption of 2.5 million gallons per year was used in these calculations.

VOC EMISSIONS

Since the entire leachate management system consists of underground collection and distribution piping, enclosed storage tanks, and underground piping to the POTW, the feasibility of VOC emissions entering the atmosphere is minimal. However, to estimate the potential to emit for the leachate management system in a worst-case scenario, the following calculation was performed assuming an average concentration of VOCs in untreated leachate of 50 micrograms per liter (μg/L). This is a conservative assumption based on site specific data obtained from the Blackburn Landfill in Catawba County, North Carolina.

<u>Potential VOC Emissions</u>

$$\left(50\frac{\mu g}{L}\right)\left(\frac{2.5\text{ x }10^{6}\text{ gal.}}{\text{year}}\right)\left(\frac{3.785\text{L}}{\text{gal.}}\right)\left(\frac{1\text{ton}}{9.1\text{x}10^{11}}\right)=5.2\text{x}10^{-4}\text{ tpy VOC}$$

As a worst case scenario, HAPs have been assumed equal to VOCs.

SECTION 5

ANAEROBIC DIGESTION FACILITY
(ES-6, CD-2)

GENERAL

The anaerobic digestion facility at the White Street Landfill is designed to process yard wastes into useable biogas for shipment to an off-site industrial end-user. The facility, expected to begin operation in September 1999, will consist of a Morbark 850-hp tub grinder (see Section 6), a 55,000 gallon day tank, a 350,000 gallon preparation tank, three 675,000 gallon anaerobic, fixed-roof digesters, an LFG Specialties, Inc. (Model # T-PCF61816) 6 inch utility flare, and assorted mobile machinery (i.e., track loaders).

Yard waste will be ground in the tub grinder and then blended with water in a day tank using a mechanical impeller. Due to size limitations in the digestion process, ground wood waste larger than two inches will be sent to a composting/mulch area to be recycled on-site or sold. Therefore, pallets and tree stumps will not be sent to the digester, but instead sent to the mulch pile. The slurry from the day tank will be pumped to an elevated, closed-roof, preparatory tank that gravity-feeds the 3 digesters. The entire digestion process will take approximately 45 to 50 days, with biogas collection occurring in the preparatory tank and digesters.

The collected biogas will be piped into the Landfill LFG collection system, utilizing the existing blower system, and then subsequently sent to Cone Mills Corporation to be used as boiler fuel. During operational down times at Cone Mills (i.e., the biogas is not sold), the gas will be sent to an on-site utility flare separate from that of the Landfill LFG system. The inlet flow design capacity of the flare is 590 scfm.

The emissions presented in this inventory and reported in the Part 70 permit application are based on the operation of the anaerobic digester and biogas flare, while the emissions inventory of the tub grinder is presented in Section 6.

DIGESTER EMISSIONS

Due to the completely enclosed nature of the anaerobic digesters, preparatory tank and collection piping, fugitive emissions beyond those collected from the digester system are expected to be quite minimal. Nonetheless, an emission estimate was made to present the worst-case scenario of an uncontrolled release of biogas to the atmosphere. In the absence of site-specific VOC and HAP emissions, a conservative estimate was made using aerobic yard and municipal solid waste composting values. According to correspondence with DE&S, the actual VOC and HAP emissions from the digesters is expected to be much lower than that presented herein.

The VOC emissions estimate for the digester is presented in Table 5A. To be additionally conservative, HAP emissions have been set equal with VOC emissions.

TABLE 5A. POTENTIAL ANAEROBIC DIGESTER EMISSIONS [1]

Compound	Maximum Observed Concentration (ug/m^3)	Mass of Emissions [2] (tons/yr)
Benzene	150	1.32E-05
2-Butanone	36,000	3.16E-03
n-Butylbenzene	47	4.13E-06
sec-Butylbenzene	15	1.32E-06
Carbon disulfide	9	7.91E-07
Carbon tetrachloride	58	5.10E-06
Chlorobenzene	2	1.76E-07
Chloroform	7	6.15E-07
4-Chlorotoluene	25	2.20E-06
1,4-Dichlorobenzene	6	5.27E-07
Ethylbenzene	38,100	3.35E-03
Hexachlorobutadiene	0.1	8.78E-09
2-Hexanone	1,700	1.49E-04
Isopropyl benzene	51	4.48E-06
p-Isopropyl toluene	280	2.46E-05
Methylene chloride	25	2.20E-06
4-Methyl-2-pentanone	1,500	1.32E-04
Naphthalene	340	2.99E-05
n-Propyl benzene	130	1.14E-05
Styrene	260	2.28E-05
Tetrachloroethene	360	3.16E-05
Toluene	11,500	1.01E-03
1,2,3-Trichlorobenzene	0.1	8.78E-09
1,2,4-Trichlorobenzene	1	8.78E-08
1,1,1-Trichloroethane	2,300	2.02E-04
Trichloroethene	98	8.61E-06
1,2,4-Trimethylbenzene	390	3.43E-05

1,3,5-Trimethylbenzene	610	5.36E-05
m,o-Xylene	3,700	3.25E-04
p-Xylene	1,600	1.41E-04
TOTAL VOCs (tons/yr)	**0.01**	
TOTAL HAPs (tons/yr)	**0.01**	

[1] Adapted from Brian D. Eitzer, "Emissions of Volatile Organic Chemicals from Municipal Solid Waste Composting Facilities," Environmental Science & Technology, 29:896 (1995).
[2] Mass of emissions (tons/yr) = $(ug/m^3)*(40\ gal/min)*(1\ ft^3/gal)*(0.0283\ m^3/ft^3)*(525{,}389\ min/yr)/[(907{,}185\ g/ton)*(1{,}000{,}000\ ug/g)]$

FLARE EMISSIONS

The *Potential to Emit* (PTE) and actual flare emissions are calculated in this section. Potential emissions are calculated by assuming that the flare operates at its design capacity (i.e. 590 scfm) for a maximum operating duration of 24 hours per day for 365 days per year, or 8,760 hours per year. Actual emissions are calculated based on the assumption that only biogas not utilized by the industrial end-user (i.e., Cone Mills Corporation) will be sent to the flare for combustion. The actual emissions represent the average expected flow to the flare over the life of the Part 70 operating permit (i.e. 590 scfm), however, at a reduced operating duration of 2,400 hours per year, or 24 hours per day for 100 days per year. Since they are connected into the same system, it is assumed that the digester flare and the LFG flare will operate at identical durations.

The emission factors, potential emissions, and actual emissions are summarized in Table 5B. In the absence of site-specific data for the biogas flare, a conservative estimate of the biogas flare emissions potential was made using LFG flare emissions factors. It is assumed that LFG contains higher values of the compounds in the emission factors than biogas.

TABLE 5B. COMBUSTED BIOGAS EMISSIONS

Compound	Biogas Flare Emission Factors	PTE Biogas Flare Emissions (tpy)	Actual Biogas Flare Emissions (tpy)
NO_X	0.068 lb/MMBtu [1]	6.3	1.7
CO	0.37 lb/MMBtu [1]	34.4	9.4
VOCs	98 % destruction [2]	0.0002	0.0002
PM-10	0.001 lb/hr cfm CH_4 [3]	1.6	0.43

SO_2	[4]	1.23	0.35
HAPs	98 % destruction [2]	0.0002	0.0002

[1] NO_x and CO emission factors were obtained from "Landfill Gas Flare Emissions" by Louis Kalani and Ray Nardelli of LFG Specialties, Inc., presented at the SWANA 20th Annual Landfill Gas Symposium.
[2] The VOC and HAP emission factors are the destruction efficiencies guaranteed by the flare manufacturer, LFG Specialties, Inc.
[3] Emission factor obtained from AP-42, Section 4.2.
[4] SO_2 biogas emissions are based on an AP-42 concentration of 46.9 ppmv of TRS in LFG. See the Sulfur Dioxide Emissions section later in Section 3 of this emissions inventory for a detailed explanation.

Emission Rate Calculations

The biogas, for purposes of calculating the products of combustion and the associated emissions, is assumed to be 60 percent methane, 40 percent carbon dioxide with trace concentrations of nitrogen and sulfur. Concentrations of other biogas constituents are negligible with regard to the combustion process. Trace biogas constituents make up less than 1 percent of the total gas volume. The flare operating data and emission calculations are presented in the following information.

TABLE 5C. BIOGAS FLARE OPERATING DATA

Maximum firing rate of Biogas	590 scfm [1]
Maximum hours of operation	8,760 hr/yr
Actual hours of operation [2]	2,400 hr/yr
Average Btu content of Biogas [3]	600 Btu/scf

[1] Standard cubic feet per minute (scfm).
[2] Based on historical records and on-site operator estimates.
[3] The Higher Heating Value of biogas based on a methane content of 60 percent is approximately 600 British Thermal Units (Btu) per standard cubic foot (scf) of gas.

POTENTIAL EMISSIONS

The estimated maximum potential emissions are calculated below for nitrogen oxides, carbon monoxide, VOC, and sulfur oxide emissions from the flare.

PTE Heat Release (MMBtu/hr)

$$(590\ \text{scfm})\left(\frac{600\ \text{Btu}}{\text{scf}}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)\left(\frac{1\ \text{MMBtu}}{10^6\ \text{Btu}}\right)$$

= <u>21.2 MMBtu/hr</u>

Nitrogen Oxides and Carbon Monoxide Emission Rates

The calculation of the potential nitrogen oxide (NO_X) and carbon monoxide (CO) emissions are based on the emission factors shown in Table 5B and the maximum firing rate of the flare (i.e. 590 scfm of Biogas).

NO_X PTE Emissions-

$$\left(\frac{0.068\ \text{lb}\ NO_X}{\text{MMBtu}}\right)\left(\frac{21.2\ \text{MMBtu}}{\text{hr}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{yr}}\right)\left(\frac{1\ \text{ton}}{2000\ \text{lb}}\right)$$

= <u>6.3 tpy NO_X</u>

CO PTE Emissions-

$$\left(\frac{0.37\ \text{lb CO}}{\text{MMBtu}}\right)\left(\frac{21.2\ \text{MMBtu}}{\text{hr}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{yr}}\right)\left(\frac{1\ \text{ton}}{2000\ \text{lb}}\right)$$

= <u>34.4 tpy CO</u>

Particulate Matter PTE Emissions

$$\left(\frac{0.001\ \text{lb PM}-10}{\text{hr}-\text{cfm}\ CH_4}\right)(590\ \text{scfm Biogas})\left(\frac{0.6\ \text{cfm}\ CH_4}{1\ \text{cfm Biogas}}\right)\left(\frac{8{,}760\ \text{hr}}{\text{year}}\right)\left(\frac{1\ \text{ton}}{2{,}000\ \text{lb}}\right)$$

Flare PM-10 = <u>1.6 tpy</u>

VOC and HAP PTE Emissions

Following a conversation with DE&S, site-specific data for VOCs and HAPs from the biogas flare could not be obtained due to the fact that the anaerobic digester facility and flare are not yet in operation. The flare manufacturer, LFG Specialties, Inc. rated the flare at a 98 percent VOC and HAP destruction capability. Therefore, if the digester emissions were calculated to be 0.01 tpy, the flare emissions, at a 98 percent destruction, are estimated to be 0.0002 tpy for both VOCs and HAPs.

Sulfur Dioxide PTE

The emissions of sulfur oxides, particularly sulfur dioxide (SO_2), from the flare is dependent on the inlet concentration of sulfur-bearing compounds in the biogas. The calculation of the estimated SO_2 emissions from the flare is based on the assumption that all of the sulfur-bearing compounds in the biogas are oxidized to SO_2. Since site specific data was not readily available, SO_2 emissions from the flare were estimated based on the published mean concentration of TRS in LFG samples, AP-42, Section 2.4 (revised November 1998). This section reports that the mean concentration of TRS in LFG is 46.9 ppmv.

Molar Flow Rate of Biogas to the Flares-

At a maximum volumetric flow rate of 590 scfm, the molar flow rate of biogas into the flare can be calculated as shown below. For this calculation, natural gas processing standards of 60° F (520° Rankine (R)) and 1 atmosphere have been used.

$$(590\ \mathrm{scfm})\left(\frac{60\ \mathrm{min}}{\mathrm{hr}}\right)\left(\frac{1\ \mathrm{atm}}{\left(\frac{0.7302\ \mathrm{atm\ ft^3}}{\mathrm{lbmole\ R}}\right)(520^\circ\ \mathrm{R})}\right)$$

= <u>93.2 lbmole fuel/hour</u>

SO_2 PTE Emissions-

Molecular weight of Sulfur (S) = 32.06 lb/lbmole H_2S

$$\left(\frac{46.9\ lbmole\ H_2S}{10^6\ lbmole\ fuel}\right)\left(\frac{93.2\ lbmole\ fuel}{hr}\right)\left(\frac{32.06\ lb\ SO_2}{lbmole\ H_2S}\right)\left(\frac{2\ lb\ SO_2}{lb\ S}\right)\left(\frac{1\ ton}{2{,}000\ lb}\right)\left(\frac{8{,}760\ hours}{yr}\right)$$

= <u>1.23 tpy SO_2</u>

ACTUAL EMISSIONS

The actual emissions for the digester flare are calculated by using the same equations used for the calculation of potential emissions. The flare is expected to operate at its maximum capacity of 590 scfm, however, in these calculations the operating duration is reduced from a maximum potential of 8,760 hours per year (365 days per year) to 2,400 hours per year (100 days per year). This reduced estimate was obtained from discussions with on-site LFG flare station staff and includes estimated maintenance and regular downtime at the LFG/biogas industrial end-user. SCS believes this average will be conservative through the life of the Part

70 operating permit; however, an opportunity to provide actual flow values to the state will occur via annual emissions inventory reports.

The actual emissions for NO_X, CO, and SO_2 are calculated below:

Actual Heat Release (MMBtu/hr)

$$(590 \text{ scfm})\left(\frac{600 \text{ Btu}}{\text{scf}}\right)\left(\frac{60 \text{ min}}{\text{hr}}\right)\left(\frac{1 \text{ MMBtu}}{10^6 \text{ Btu}}\right)$$

= 21.2 MMBtu/hr

Actual Nitrogen Oxides Emissions

$$\left(\frac{0.068 \text{ lb } NO_X}{\text{MMBtu}}\right)\left(\frac{21.2 \text{ MMBtu}}{\text{hr}}\right)\left(\frac{2{,}400 \text{ hr}}{\text{yr}}\right)\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

= 1.7 tpy NO_X

Actual Carbon Monoxide Emissions

$$\left(\frac{0.37 \text{ lb CO}}{\text{MMBtu}}\right)\left(\frac{21.2 \text{ MMBtu}}{\text{hr}}\right)\left(\frac{2{,}400 \text{ hr}}{\text{yr}}\right)\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

= 9.4 tpy CO

Actual Sulfur Dioxide Emissions

The actual flare emissions of SO_2 are estimated using the same equations used for the PTE emissions estimate.

Actual Molar Flow Rate of Biogas to the Flares-

$$\left(\frac{590 \text{ scf Biogas}}{\text{min}}\right)\left(\frac{60 \text{ min}}{\text{hr}}\right)\left(\frac{1 \text{ atm}}{\left(\frac{0.7032 \text{ atm ft}^3 \left(520^\circ \text{ R}\right)}{\left(\text{lbmole R}\right)}\right)}\right)$$

= <u>96.8 lbmole fuel/hour</u>

Actual SO_2 Emissions-

$$\left(\frac{46.9\ lbmole\ H_2S}{10^6\ lbmole\ fuel}\right)\left(\frac{96.8\ lbmole\ fuel}{hour}\right)\left(\frac{32.06\ lb\ S}{lbmole\ H_2S}\right)\left(\frac{2\ lb\ SO_2}{lb\ S}\right)\left(\frac{ton}{2{,}000\ lb}\right)\left(\frac{2{,}400\ hour}{year}\right)$$

= <u>0.35 tpy SO_2</u>

<u>Actual Particulate Matter Emisions</u>

$$\left(\frac{0.001 \text{ lb PM} - 10}{\text{hr} - \text{cfm CH}_4}\right)\left(590 \text{ scfm Biogas}\right)\left(\frac{0.6 \text{ cfm CH}_4}{1 \text{ cfm Biogas}}\right)\left(\frac{2{,}400 \text{ hour}}{\text{year}}\right)\left(\frac{1 \text{ ton}}{2{,}000 \text{ lb}}\right)$$

Flare PM – 10 = <u>0.43 tpy</u>

<u>Actual VOC and HAP Emissions</u>

To be conservative, the actual VOC and HAP emissions are assumed equal to the potential VOC and HAP emissions.

SECTION 6

TUB GRINDER
(ES-4)

GENERAL

A diesel-fueled, 850-hp tub grinder will be located in the Anaerobic Digestion Facility at the Landfill. The grinder is expected to begin operation in September of 1999 when the anaerobic digesters become operational. It will grind brush, yard waste, and other suitable wood waste received by the Landfill to be input into the anaerobic digester or processed as mulch. The manufacturer of the grinder (Model No.1300) will be Morbark of Winn, Michigan.

POTENTIAL EMISSIONS

The tub grinder's engine emissions factors for NO_X, CO, SO_X, PM-10, and VOC could not be obtained from the manufacturer; therefore, the emission factors used to estimate the maximum potential emissions were based on AP-42, Sections 3.3 and 3.4. The potential emissions listed in Table 6A assume the tub grinder will operate at approximately 3,744 hours per year. This is assuming an overly conservative operating estimate of 6 days per week at 12 hours per day. The actual emissions listed in Table 6A were set equal to the expected operating schedule of approximately 2,340 hours, or 260 working days, per year. According to correspondence with the City, the tub grinder will be used approximately 8 to 9 hours per day for an average of 5 days per week.

TABLE 6A. TUB GRINDER COMBUSTION EMISSIONS

Pollutant	Emission Factor [1] (lb/hp/hr)	Potential Emissions [2] (tpy)	Actual Emissions [3] (tpy)
NO_X	2.4×10^{-2}	38.2	23.9
CO	5.5×10^{-3}	8.8	5.5
SO_X [4]	8.09×10^{-3}	12.9	8.0
PM-10 [5]	4.01×10^{-4}	0.64	0.40
VOC [6]	7.05×10^{-4}	1.1	0.70
HAPs			
Benzene [5]	5.43×10^{-6}	0.009	0.005
Toluene [5]	1.96×10^{-6}	0.003	0.002
Xylenes [5]	1.35×10^{-6}	0.002	0.001

Propylene [5]	1.95×10^{-5}	0.03	0.02
Formaldehyde [5]	5.52×10^{-7}	0.0009	0.0006
Acetaldehyde [5]	1.76×10^{-7}	0.0003	0.0002
Acrolein [5]	5.52×10^{-8}	0.00009	0.00006
Total PAH [5] [7]	1.48×10^{-6}	0.002	0.002
Total HAPs		0.047	0.031

1 The emissions factors for a large diesel-fueled engine (tub grinder) were based on Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4 in AP-42, Section 3.4.
2 The potential emissions were calculated assuming the engine operates 3,744 hours per year.
3 The actual emissions were calculated assuming the engine operates 2,340 hours per year.
4 The sulfur content of No. 2 diesel fuel was assumed to be 0.3 percent.
5 The break-specific fuel consumption (BSFC) used to convert from lb/MMBtu to lb/hp-hr was 7,000 Btu/hp-hr. This was obtained from AP-42, Section 3.4, Table 3.4-1. The use of this conversion was necessary where AP-42 failed to provide sufficient information regarding emission factors.
6 The emission factors in Table 3.4-1 of AP-42 represent total organic compounds (TOC). The VOC potential emissions were calculated assuming VOC is equal to TOC. The emission factor includes exhaust and crankcase emissions.
7 PAH is an abbreviation for Polycyclic Aromatic Hydrocarbons.

<u>**Tub Grinder Emissions Sample Calculations:**</u>

Potential Emissions--

$$NO_X = \left(\frac{2.4 \times 10^{-2}\ \mathrm{lb}}{\mathrm{hp-hr}}\right)(850\ \mathrm{hp})\left(\frac{3{,}744\ \mathrm{hr}}{\mathrm{yr}}\right)\left(\frac{1\ \mathrm{ton}}{2{,}000\ \mathrm{lb}}\right) = 38.2\ \mathrm{tpy}$$

Actual Emissions--

$$NO_X = \left(\frac{2.4 \times 10^{-2}\ \mathrm{lb}}{\mathrm{hp-hr}}\right)(850\ \mathrm{hp})\left(\frac{2{,}340\ \mathrm{hr}}{\mathrm{yr}}\right)\left(\frac{1\ \mathrm{ton}}{2{,}000\ \mathrm{lb}}\right) = 23.9\ \mathrm{tpy}$$

SECTION 7

FUEL STORAGE TANKS
(ES-7, ES-8)

GENERAL

The Landfill has two, below-grade, horizontal, liquid petroleum storage tanks on-site. The first is a 10,000 gallon unleaded gasoline fuel tank, and the second is a 20,000 gallon diesel fuel tank. Both tanks are located at the maintenance facility and are used to fuel site vehicles and machinery.

EMISSIONS ESTIMATES

The emissions from the fuel storage tanks were estimated using the U.S. EPA's Tanks 4.02 Model. Specific information concerning the storage tanks was obtained from representatives of the City. Table 7A summarizes each tank and the corresponding estimated emissions. The output from the model as well as the tank data entered into the program is shown in Appendix C.

TABLE 7A. FUEL STORAGE TANKS SUMMARY

Contents	Volume (gal)	Tank Length (ft)	Tank Diameter (ft)	Turnovers per year	Net Through-put (gal/yr)	Estimated VOC Emissions[1] (lb/yr)	Estimated VOC Emissions (tons/yr)
Unleaded Gasoline	10,000	27	8	2	20,000	194.52	0.097
Diesel Fuel	20,000	34.5	10	14	280,000	5.12	0.003

[1] Emissions estimated using U.S. EPA's Tanks 4.02 Model. Output is located in Appendix C.

As a worst case scenario, HAPs have been assumed equal to VOCs.

To be conservative, the unleaded gasoline was input to the model with the maximum available Reid Vapor Pressure (RVP) offered in the software program. This should account for the potential worst-case emissions from the unleaded gasoline storage tank.

Since the total VOC emissions from the diesel tank are considerably less than 1 ton per year, this emission source (ES-8) is considered to be an insignificant source of air pollution and is therefore included on the Title V permit application forms (page E2) under "Insignificant Emission Units/Activities".

SECTION 8

INSIGNIFICANT AND EXEMPT ACTIVITIES

GENERAL

This section addresses the insignificant and exempt sources of air pollution at the Landfill. A *Checkoff List* of emissions units and activities exempt from the Part 70 permit is included in the Air Operating Permit Application. According to 15A NCAC 2Q.0102 of the North Carolina air pollution regulations, a source that is subject to any of the rules listed in 15A NCAC 2Q.0102(a) is *not exempted* from permit requirements. Activities that *do not* require a permit or a permit modification are listed in two parts in 15A NCAC 2Q.0102(b). Part 1 lists activities that are exempted due to category, and Part 2 lists activities exempted because of size or production rate.

MOBILE SOURCES

Motor vehicles and machinery or equipment that is normally used in a mobile capacity are exempted from consideration in the Part 70 permit application. These exempted mobile sources include engine emissions from site vehicles, bulldozers, scrapers, compactors, loaders, dump trucks, and other related heavy machinery.

HAUL ROADS AND EARTH MOVING OPERATIONS

According to the NCDENR, PM-10 emissions from landfilling operations such as the paved and unpaved haul roads, the active working face, and the borrow area are exempted from inclusion in the Part 70 permit application. However, PM-10 emissions from equipment such as tub grinders and utility flares are to be included in an air operating permit for the State of North Carolina. Appendix F contains a recent telephone record with the NCDENR clarifying this subject.

SMALL STORAGE TANKS

According to 15A NCAC 2Q.0102(b)2A(i), air pollutant emissions from storage tanks with capacities less than 1,100 gallons are considered negligible. The following storage tanks located at the Landfill meet this criterion:

- A 250 gallon propane tank (located at the LFG flare station).
- Various small storage containers containing new and used motor oil, hydraulic fluid, antifreeze, and other maintenance shop supplies.

DIVISION E

REFERENCES

WHITE STREET LANDFILL
REFERENCE LIST

FEDERAL AIR OPERATING PERMIT APPLICATION

1. Tier 2 NMOC Emission Rate Report for the White Street Landfill. May 18, 1999. Prepared by SCS Engineers, PC.

2. Landfill Gas Utilization Project Field Test Program for the White Street Sanitary Landfill. September 15, 1995. Prepared by SCS Engineers.

APPENDIX A

SITE PLAN, SITE LOCATION MAP, AND FLOW CHARTS

DR KLC DATE: 8-18-99 FILE NAME: 0298302.02

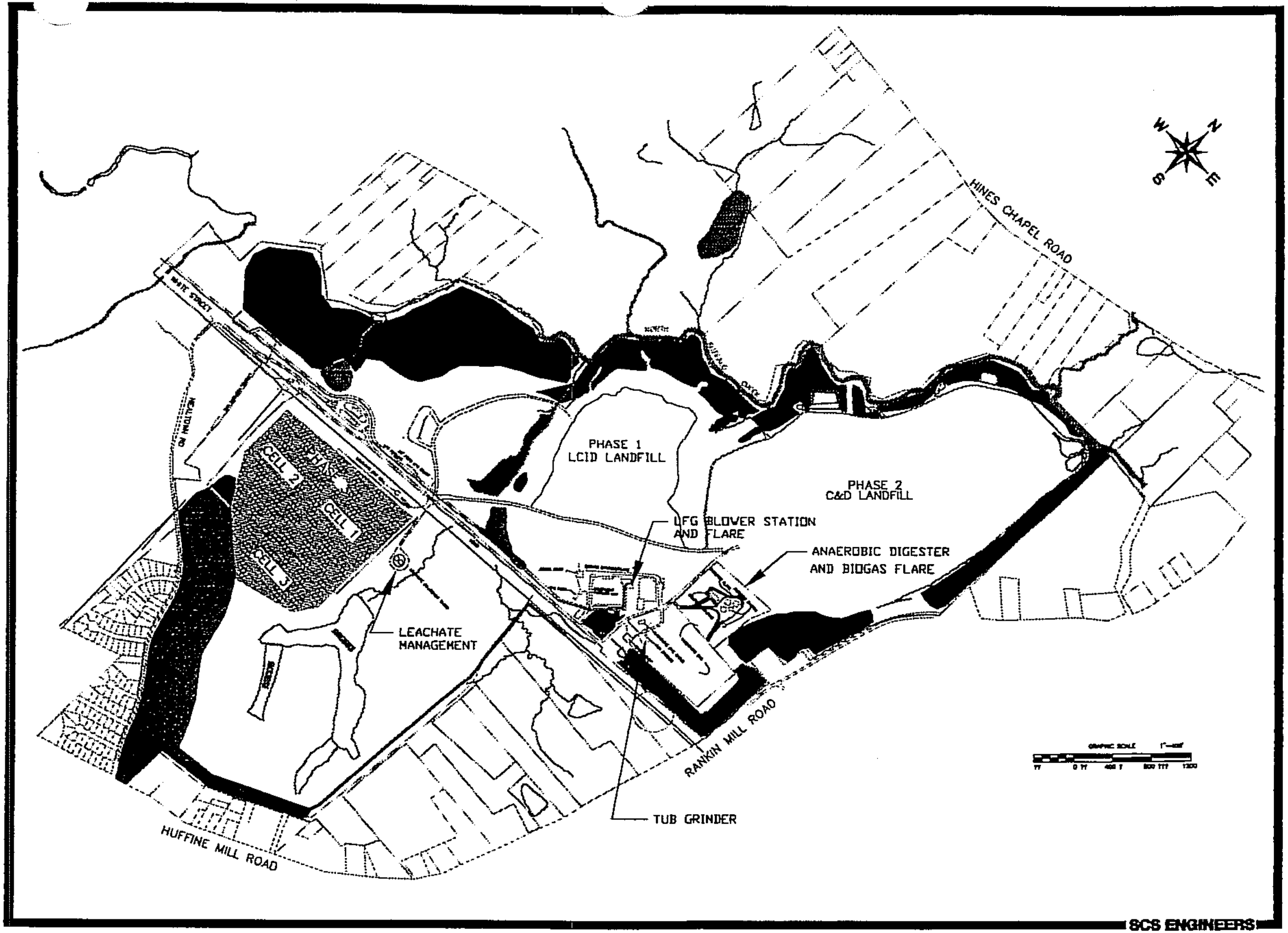
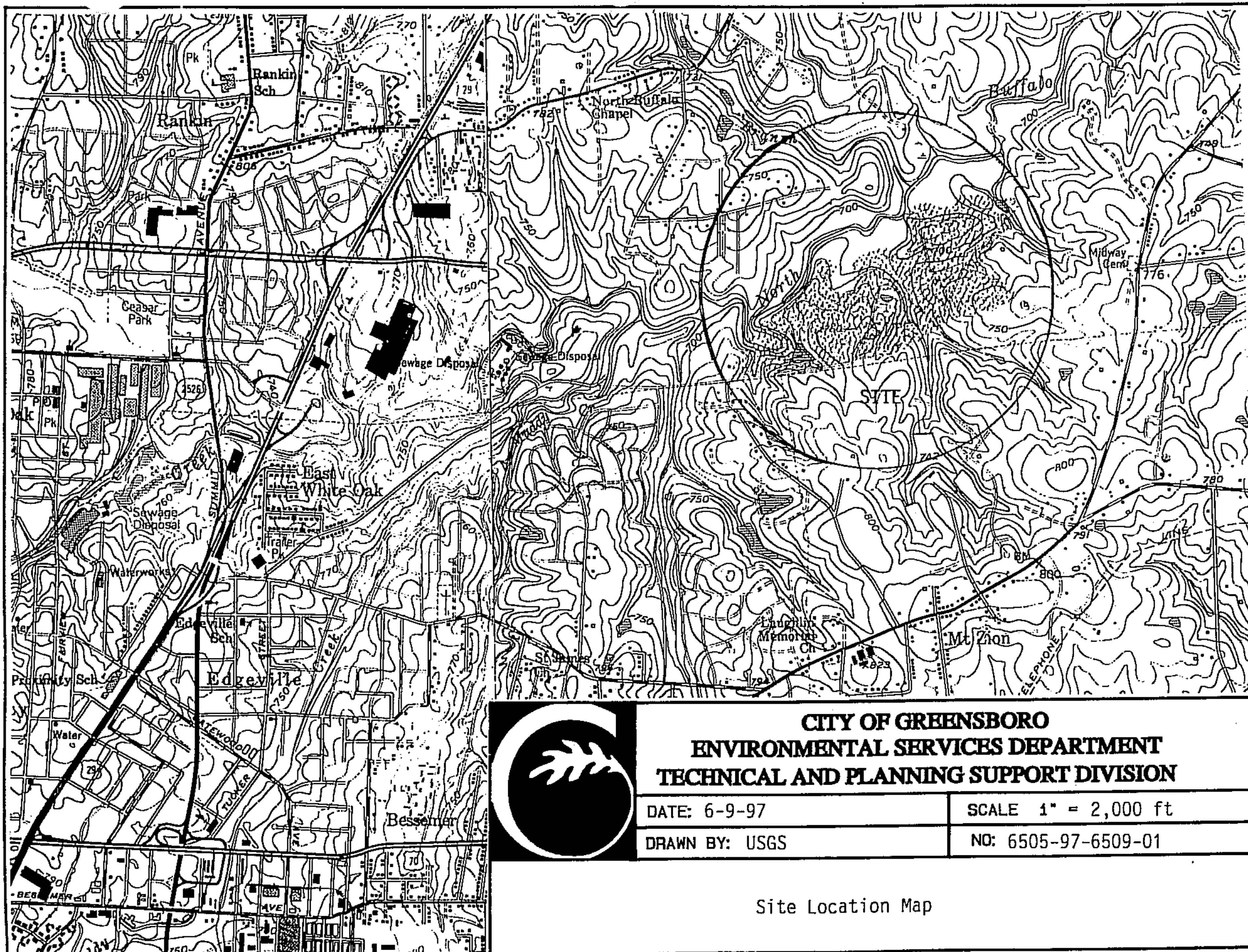


FIGURE 1A. WHITE STREET LANDFILL SITE PLAN



CITY OF GREENSBORO **ENVIRONMENTAL SERVICES DEPARTMENT** **TECHNICAL AND PLANNING SUPPORT DIVISION**	
DATE: 6-9-97	SCALE 1" = 2,000 ft
DRAWN BY: USGS	NO: 6505-97-6509-01

Site Location Map

DRAWN BY: KLC DATE: 7-22-99 FILE NAME: 0296302.02

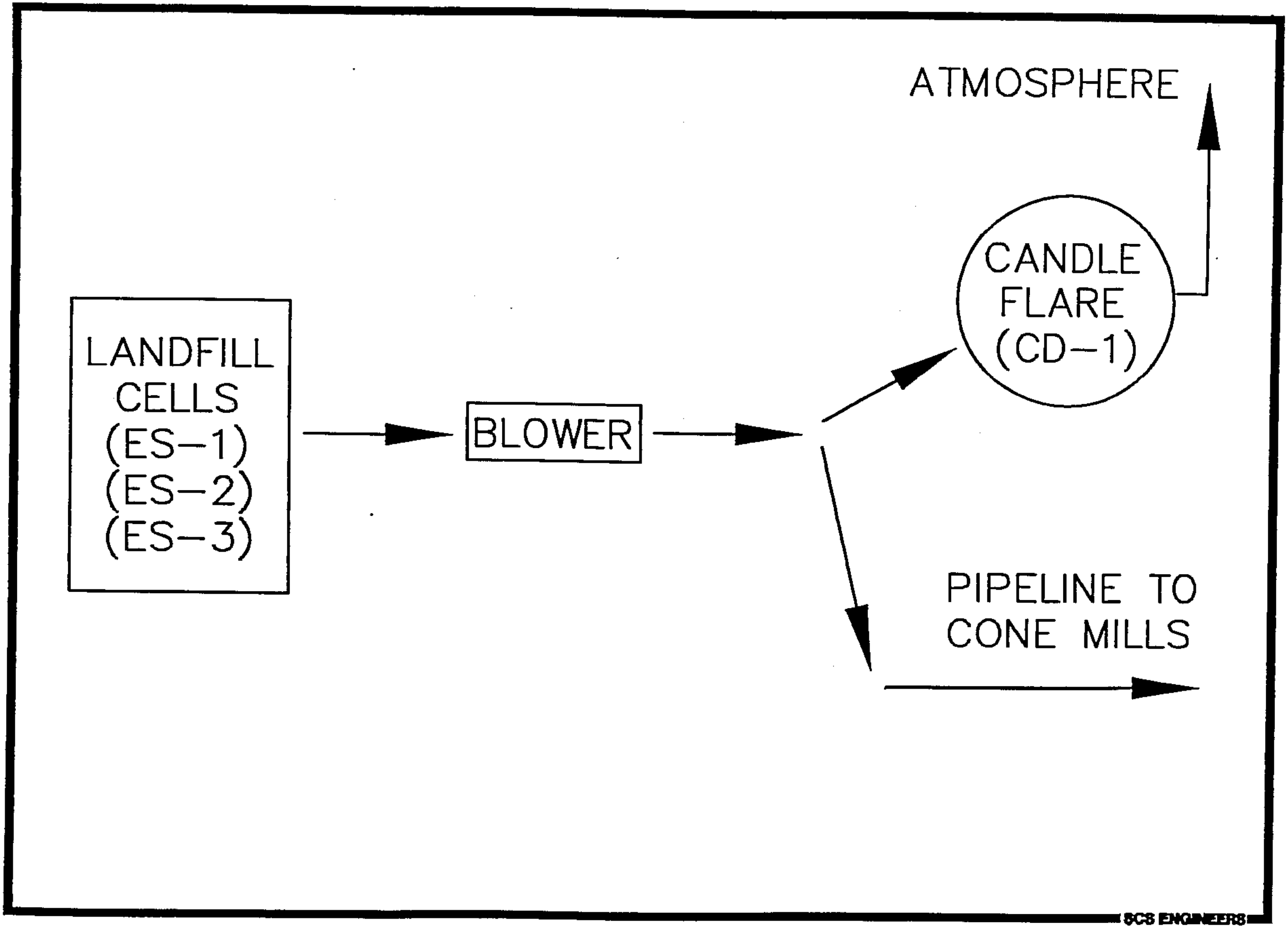


EXHIBIT 1. LFG FLOW CHART

DR... BY: KLC DATE: 7-22-99 FILE NAME: 0298302.02

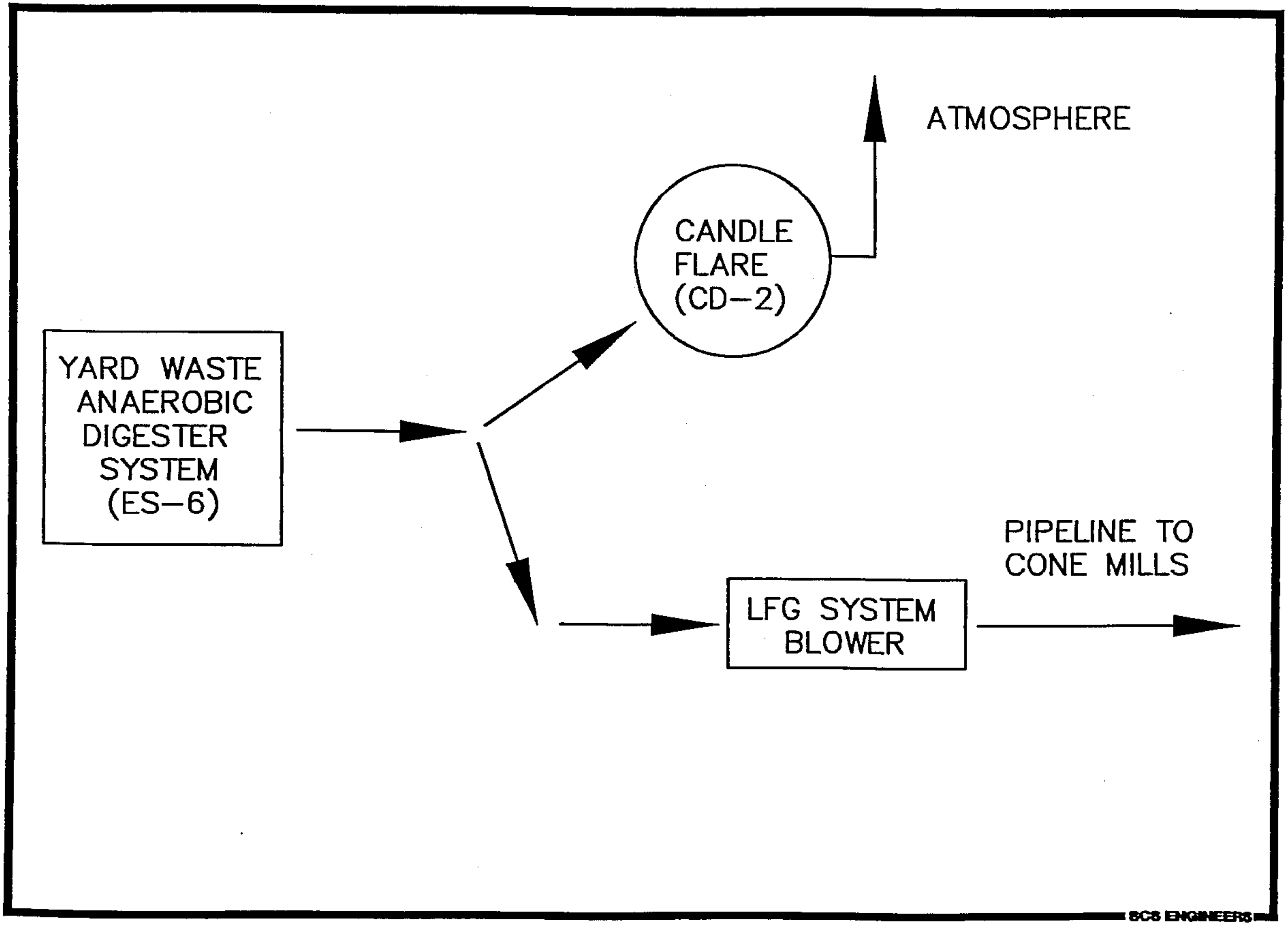


EXHIBIT 2. BIOGAS FLOW CHART

DRAWN B... LC DATE: 7-22-99 FILE NAME: 0298302.02

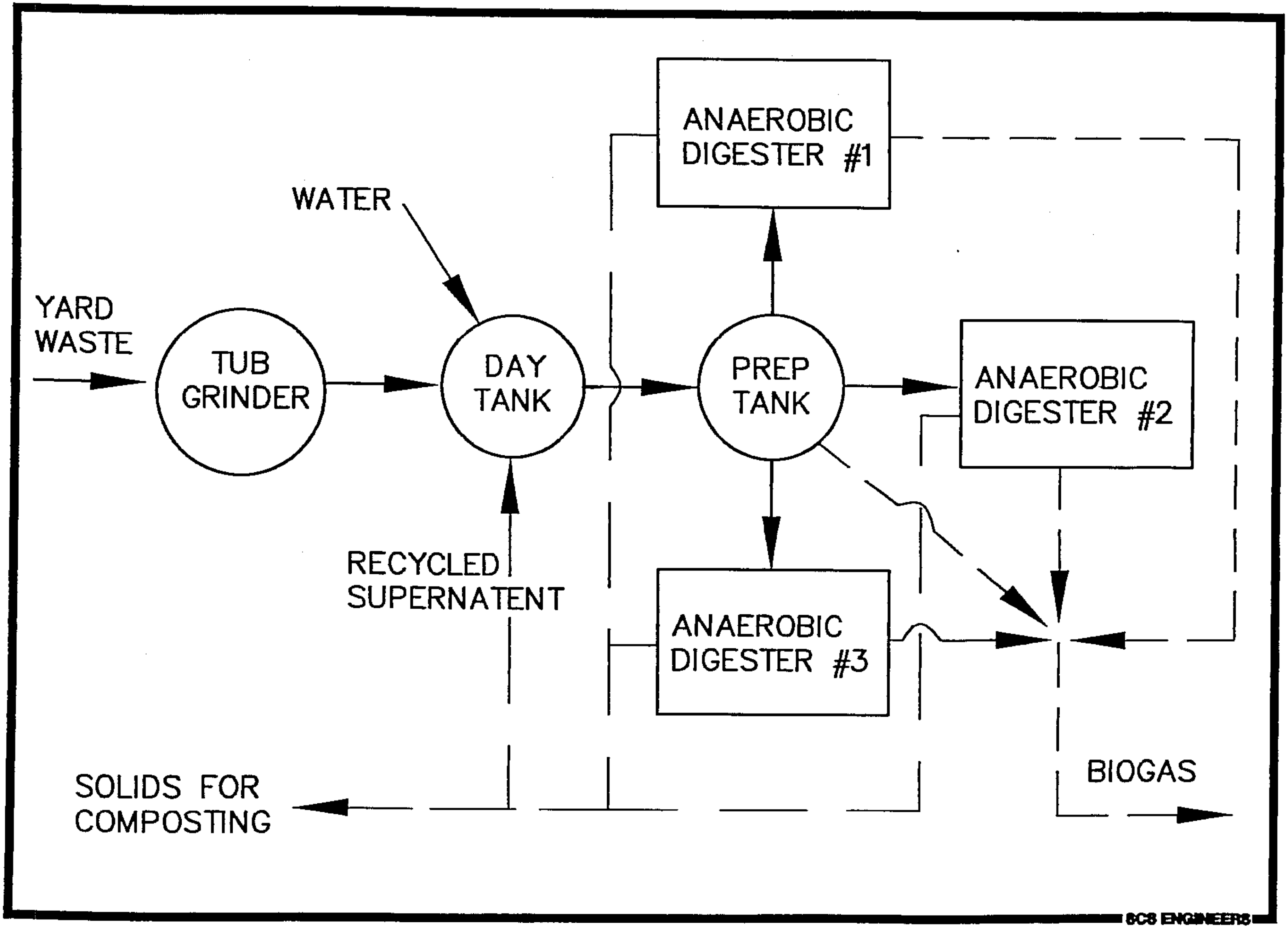


EXHIBIT 3. ANAEROBIC YARD WASTE DIGESTION FACILITY

APPENDIX B

CONSISTENCY DETERMINATION

CITY OF GREENSBORO

NORTH CAROLINA

P.O. BOX 3136
GREENSBORO, NC 27402-3136

June 5 1997

NCDEHNR - Air Quality Section
585 Waughton Street
Winston-Salem, NC 27107-2241

Re: Air Permit Application - Local Consistency Determination for White Street Landfill

Gentlemen:

The City of Greensboro has received a request from the State of North Carolina concerning an Air Permit Application. In accordance with North Carolina Air Permit Application Regulations (General Statute 143-215.108(d&f)), the City of Greensboro has been requested to submit a letter indicating that the proposed facility complies with zoning and subdivision regulations.

The property where the White Street Landfill is located 3503 White Street is currently zoned CU-HI (Conditional Use-Heavy Industrial) which permits the proposed use. This property currently complies with all zoning and subdivision regulations. The City of Greensboro currently does not have any air emission control regulations within our zoning ordinance.

If you have any questions concerning this matter, please do not hesitate to contact me.

Sincerely,

Loray B. Averett

Loray B. Averett
Zoning Enforcement Officer
(910) 373-2630 (Voice)
(910) 333-6930 (TDD)

APPENDIX C

MODEL OUTPUT AND EMISSIONS CALCULATIONS

PROJECTED LFG AND NMOC GENERATION RATES
WHITE STREET LANDFILL, GREENSBORO, NC

Year	Disposal Rate (tons/yr)	Refuse In-Place (tons)	Disposal Rate (Mg/yr)	Refuse In-Place (Mg)	Methane Generation Rates (m^3/yr)	LFG Generation Rates (cfm)	NMOC Generation Rates (tons/yr)
1965	186,275	0	168,986	0	0.000E+00	0	0
1966	192,795	186,275	174,900	168,986	6.759E+05	91	1
1967	199,542	379,070	181,022	343,886	1.349E+06	181	1
1968	206,526	578,612	187,358	524,908	2.020E+06	271	2
1969	213,755	785,138	193,915	712,266	2.690E+06	362	3
1970	221,236	998,893	200,702	906,181	3.361E+06	452	3
1971	228,980	1,220,130	207,727	1,106,883	4.032E+06	542	4
1972	236,994	1,449,109	214,997	1,314,610	4.704E+06	632	4
1973	245,289	1,686,103	222,522	1,529,607	5.380E+06	723	5
1974	253,874	1,931,392	230,310	1,787,167	6.059E+06	814	6
1975	262,759	2,185,265	238,371	2,017,477	6.743E+06	906	6
1976	271,956	2,448,025	246,714	2,255,848	7.432E+06	999	7
1977	281,474	2,719,980	255,349	2,502,563	8.127E+06	1,092	8
1978	240,000	3,001,455	217,724	2,757,912	8.830E+06	1,187	8
1979	240,000	3,241,455	217,724	2,995,048	9.355E+06	1,257	9
1980	240,000	3,481,455	217,724	3,055,859	9.859E+06	1,325	9
1981	240,000	3,721,455	217,724	3,273,583	1.034E+07	1,390	10
1982	240,000	3,961,455	217,724	3,491,307	1.081E+07	1,452	10
1983	240,000	4,201,455	217,724	3,709,032	1.126E+07	1,513	11
1984	240,000	4,441,455	217,724	3,926,756	1.169E+07	1,570	11
1985	239,000	4,681,455	216,817	4,144,480	1.210E+07	1,626	12
1986	262,000	4,920,455	237,682	4,361,297	1.249E+07	1,678	12
1987	292,000	5,182,455	264,898	4,598,980	1.295E+07	1,740	12
1988	344,000	5,474,455	312,072	4,863,878	1.350E+07	1,815	13
1989	342,000	5,818,455	310,257	5,175,949	1.422E+07	1,911	14
1990	340,000	6,160,455	308,443	5,486,206	1.491E+07	2,003	14
1991	331,000	6,500,455	300,278	5,794,649	1.555E+07	2,090	15
1992	292,000	6,831,455	264,898	6,094,927	1.615E+07	2,170	15
1993	236,000	7,123,455	214,096	6,359,825	1.657E+07	2,227	16
1994	241,000	7,359,455	218,632	6,573,921	1.678E+07	2,255	16
1995	253,050	7,600,455	229,563	6,792,553	1.700E+07	2,284	16
1996	265,703	7,853,505	241,041	7,022,116	1.725E+07	2,318	16
1997	278,988	8,119,207	253,093	7,263,157	1.754E+07	2,356	17
1998	292,937	8,398,195	265,748	7,516,250	1.786E+07	2,400	17
1999	307,584	8,691,132	279,035	7,781,998	1.822E+07	2,449	17
2000	322,963	8,998,716	292,987	8,061,034	1.862E+07	2,503	18
2001	339,111	9,321,679	307,637	8,354,021	1.907E+07	2,562	18
2002	356,067	9,660,790	323,018	8,661,657	1.955E+07	2,627	19
2003	373,870	10,016,857	339,169	8,984,676	2.007E+07	2,698	19
2004	392,564	10,390,727	356,128	9,323,845	2.064E+07	2,774	20
2005	412,192	10,783,290	373,934	9,679,973	2.126E+07	2,857	20
2006	432,801	11,195,482	392,631	10,053,907	2.192E+07	2,946	21
2007	454,441	11,628,284	412,262	10,446,537	2.263E+07	3,041	22
2008	477,164	12,082,725	432,875	10,858,800	2.339E+07	3,144	22
2009	0	12,559,889	0	11,291,675	2.421E+07	3,253	23
2010	0	12,559,889	0	11,291,675	2.326E+07	3,126	22
2011	0	12,559,889	0	11,291,675	2.235E+07	3,003	21
2012	0	12,559,889	0	11,291,675	2.147E+07	2,885	21
2013	0	12,559,889	0	11,291,675	2.063E+07	2,772	20
2014	0	12,559,889	0	11,291,675	1.982E+07	2,663	19
2015	0	12,559,889	0	11,291,675	1.904E+07	2,559	18
2016	0	12,559,889	0	11,291,675	1.830E+07	2,459	17
2017	0	12,559,889	0	11,291,675	1.758E+07	2,362	17
2018	0	12,559,889	0	11,291,675	1.689E+07	2,270	16
2019	0	12,559,889	0	11,291,675	1.623E+07	2,181	16
2020	0	12,559,889	0	11,291,675	1.559E+07	2,095	15

ESTIMATED NMOC CONCENTRATION IN LFG: 121 ppmv
ASSUMED METHANE CONTENT OF LFG: 50%
SELECTED DECAY RATE CONSTANT (k): 0.04
SELECTED ULTIMATE METHANE GENERATION RATE (L_o): 3203.7 ft3/ton
METRIC EQUIVALENT: 100 cu m/Mg

Conversions:
35.314667 cu ft per cu m
1.1023113 ton per Mg
32.037 cu ft/ton per cu m/Mg

1/10/00

PROJECTED LFG RECOVERY RATES
WHITE STREET LANDFILL GREENSBORO, NC

Year	Disposal Rate (tons/yr)	Refuse In-Place (tons)	System Coverage (%)	LFG Recovery Potential (cfm)	LFG Recovery Potential (mmcf/day)	LFG Recovery Potential (mmBtu/yr)	Projected LFG Recovery Rate from Existing/Proposed System (cfm)	(mmcf/day)	mmBtu/yr
1965	186,275	186,275	75%	0	0.00	0	0	0.000	0
1966	192,795	379,070	75%	87	0.13	22,937	65	0.094	17,203
1967	199,542	578,612	75%	174	0.25	45,777	131	0.188	34,333
1968	206,526	785,138	75%	261	0.38	68,553	196	0.282	51,415
1969	213,755	998,893	75%	347	0.50	91,295	261	0.375	68,472
1970	221,236	1,220,129	75%	434	0.62	114,036	325	0.469	85,527
1971	228,980	1,449,109	75%	521	0.75	136,807	390	0.562	102,605
1972	236,994	1,686,103	75%	607	0.87	159,638	456	0.656	119,728
1973	245,289	1,931,392	75%	695	1.00	182,561	521	0.750	136,920
1974	253,874	2,185,266	75%	782	1.13	205,606	587	0.845	154,204
1975	262,759	2,448,025	75%	871	1.25	228,805	653	0.940	171,604
1976	271,956	2,719,981	75%	960	1.38	252,188	720	1.036	189,141
1977	281,474	3,001,455	75%	1,049	1.51	275,787	787	1.133	206,840
1978	240,000	3,241,455	75%	1,140	1.64	299,632	855	1.231	224,724
1979	240,000	3,481,455	75%	1,208	1.74	317,436	906	1.305	238,077
1980	240,000	3,721,455	75%	1,273	1.83	334,541	955	1.375	250,906
1981	240,000	3,961,455	75%	1,336	1.92	350,976	1,002	1.442	263,232
1982	240,000	4,201,455	75%	1,396	2.01	366,767	1,047	1.507	275,075
1983	240,000	4,441,455	75%	1,453	2.09	381,938	1,090	1.570	286,453
1984	240,000	4,681,455	75%	1,509	2.17	396,514	1,132	1.630	297,386
1985	239,000	4,920,455	75%	1,562	2.25	410,519	1,172	1.687	307,889
1986	262,000	5,182,455	75%	1,613	2.32	423,851	1,210	1.742	317,889
1987	292,000	5,474,455	75%	1,672	2.41	439,493	1,254	1.806	329,620
1988	344,000	5,818,455	75%	1,744	2.51	458,216	1,308	1.883	343,662
1989	342,000	6,160,455	75%	1,836	2.64	482,607	1,377	1.983	361,955
1990	340,000	6,500,455	75%	1,925	2.77	505,796	1,443	2.079	379,347
1991	331,000	6,831,455	75%	2,008	2.89	527,829	1,506	2.169	395,872
1992	292,000	7,123,455	75%	2,085	3.00	547,891	1,564	2.252	410,918
1993	236,000	7,359,455	75%	2,140	3.08	562,363	1,605	2.311	421,772
1994	241,000	7,600,455	75%	2,167	3.12	569,372	1,625	2.340	427,029
1995	253,050	7,853,505	75%	2,195	3.16	576,722	1,646	2.370	432,542
1996	265,703	8,119,208	75%	2,227	3.21	585,268	1,670	2.405	438,951
1997	278,988	8,398,196	75%	2,264	3.26	595,036	1,698	2.445	446,277
1998	292,937	8,691,133	75%	2,306	3.32	606,058	1,730	2.491	454,543
1999	307,584	8,998,717	75%	2,353	3.39	618,365	1,765	2.541	463,773
2000	322,963	9,321,680	75%	2,405	3.46	631,993	1,804	2.597	473,994
2001	339,111	9,660,791	75%	2,462	3.55	646,980	1,846	2.659	485,235
2002	356,067	10,016,858	75%	2,524	3.63	663,368	1,893	2.726	497,526
2003	373,870	10,390,728	75%	2,592	3.73	681,201	1,944	2.799	510,901
2004	392,564	10,783,292	75%	2,666	3.84	700,527	1,999	2.879	525,395
2005	412,192	11,195,484	75%	2,745	3.95	721,397	2,059	2.965	541,048
2006	432,801	11,628,285	75%	2,831	4.08	743,866	2,123	3.057	557,899
2007	454,441	12,082,726	75%	2,922	4.21	767,991	2,192	3.156	575,994
2008	477,164	12,559,890	75%	3,021	4.35	793,836	2,266	3.262	595,377
2009	0	12,559,890	75%	3,126	4.50	821,464	2,344	3.376	616,098
2010	0	12,559,890	75%	3,003	4.32	789,254	2,252	3.244	591,941
2011	0	12,559,890	75%	2,885	4.16	758,307	2,164	3.116	568,730
2012	0	12,559,890	75%	2,772	3.99	728,573	2,079	2.994	546,430
2013	0	12,559,890	75%	2,664	3.84	700,006	1,998	2.877	525,004
2014	0	12,559,890	75%	2,559	3.69	672,558	1,919	2.764	504,419
2015	0	12,559,890	75%	2,459	3.54	646,187	1,844	2.656	484,640
2016	0	12,559,890	75%	2,362	3.40	620,849	1,772	2.551	465,637
2017	0	12,559,890	75%	2,270	3.27	596,505	1,702	2.451	447,379
2018	0	12,559,890	75%	2,181	3.14	573,116	1,636	2.355	429,837
2019	0	12,559,890	75%	2,095	3.02	550,644	1,571	2.263	412,983
2020	0	12,559,890	75%	2,013	2.90	529,053	1,510	2.174	396,790

ASSUMED METHANE CONTENT OF LFG: 50%
SELECTED DECAY RATE CONSTANT: 0.040
SELECTED ULTIMATE METHANE RECOVERY RATE: 3,204 cu ft/ton

8/27/99

WHITE STREET LANDFILL
HAP EMISSIONS

1998 Total Methane Generation (m^3/yr) = **17,860,000**
LFG Collection Efficiency (%) = **75.0 %**
Destruction Efficiency (%) = **98.0 %**

			1998 Emissions					Uncombusted
Pollutant	Mol. Wt. (g/gmol)	Conc. (ppmv)	Q_p (m^3/yr)	M_p (kg/yr)	M_p (tpy)	FM_p (tpy)	M_p-FM_p (tpy)	HAPs (tpy)
1,1,1-trichloroethane	133.41	0.48	15.60	85.13	0.09	0.02	0.07	0.00
1,1,2,2-tetrachloroethane	167.85	1.11	36.08	247.69	0.27	0.07	0.20	0.00
1,1-dichloroethane	98.97	2.35	76.39	309.19	0.34	0.09	0.26	0.01
1,1-dichloroethene	96.94	0.20	6.50	25.77	0.03	0.01	0.02	0.00
1,2-dichloroethane	98.96	0.41	13.33	53.94	0.06	0.01	0.04	0.00
1,2-dichloropropane	112.99	0.18	5.85	27.04	0.03	0.01	0.02	0.00
acrylonitrile	53.06	6.33	205.76	446.51	0.49	0.12	0.37	0.01
carbon disulfide	76.13	0.58	18.85	58.70	0.06	0.02	0.05	0.00
carbon tetrachloride	153.84	0.004	0.13	0.82	0.00	0.00	0.00	0.00
carbonyl sulfide	60.07	0.49	15.93	39.13	0.04	0.01	0.03	0.00
chlorobenzene	112.56	0.25	8.13	37.41	0.04	0.01	0.03	0.00
chloroethane	64.52	1.25	40.63	107.22	0.12	0.03	0.09	0.00
chloroform	119.39	0.03	0.98	4.76	0.01	0.00	0.00	0.00
dichlorobenzene	147.00	0.21	6.83	41.04	0.05	0.01	0.03	0.00
dichloromethane	84.94	14.30	464.82	1614.75	1.78	0.44	1.33	0.03
ethylbenzene	106.16	4.61	149.85	650.61	0.72	0.18	0.54	0.01
ethylene dibromide	187.88	0.001	0.03	0.25	0.00	0.00	0.00	0.00
hexane	86.18	6.57	213.56	752.71	0.83	0.21	0.62	0.01
methyl ethyl ketone	72.11	7.09	230.46	679.67	0.75	0.19	0.56	0.01
methyl isobutyl ketone	100.16	1.87	60.78	249.00	0.27	0.07	0.21	0.00
perchloroethylene	165.83	3.73	121.24	822.30	0.91	0.23	0.68	0.01
trichloroethylene	131.40	2.82	91.66	492.61	0.54	0.14	0.41	0.01
vinyl chloride	62.50	7.34	238.59	609.87	0.67	0.17	0.50	0.01
xylenes	106.16	12.10	393.31	1707.67	1.88	0.47	1.41	0.03
Total HAPs	---	---	---	9063.78	9.99	2.50	7.49	0.15

WHITE STREET LANDFILL
HAP EMISSIONS

1999 Total Methane Generation (m^3/yr) = 18,220,000
LFG Collection Efficiency (%) = 75.0 %
Destruction Efficiency (%) = 98.0 %

1999 Emissions					Uncombusted
Q_p (m^3/yr)	M_p (kg/yr)	M_p (tpy)	FM_p (tpy)	M_p-FM_p (tpy)	HAPs (tpy)
15.92	86.85	0.10	0.02	0.07	0.00
36.81	252.68	0.28	0.07	0.21	0.00
77.93	315.43	0.35	0.09	0.26	0.01
6.63	26.29	0.03	0.01	0.02	0.00
13.60	55.03	0.06	0.02	0.05	0.00
5.97	27.58	0.03	0.01	0.02	0.00
209.91	455.51	0.50	0.13	0.38	0.01
19.23	59.88	0.07	0.02	0.05	0.00
0.13	0.83	0.00	0.00	0.00	0.00
16.25	39.92	0.04	0.01	0.03	0.00
8.29	38.16	0.04	0.01	0.03	0.00
41.45	109.38	0.12	0.03	0.09	0.00
0.99	4.86	0.01	0.00	0.00	0.00
6.96	41.87	0.05	0.01	0.03	0.00
474.19	1647.30	1.82	0.45	1.36	0.03
152.87	663.72	0.73	0.18	0.55	0.01
0.03	0.25	0.00	0.00	0.00	0.00
217.86	767.89	0.85	0.21	0.63	0.01
235.11	693.37	0.76	0.19	0.57	0.01
62.01	254.02	0.28	0.07	0.21	0.00
123.69	838.87	0.92	0.23	0.69	0.01
93.51	502.54	0.55	0.14	0.42	0.01
243.40	622.16	0.69	0.17	0.51	0.01
401.24	1742.09	1.92	0.48	1.44	0.03
----	9246.48	10.19	2.55	7.64	0.15

2000 Total Methane Generation (m^3/yr) = 18,620,000
LFG Collection Efficiency (%) = 75.0 %
Destruction Efficiency (%) = 98.0 %

2000 Emissions					Uncombusted
Q_p (m^3/yr)	M_p (kg/yr)	M_p (tpy)	FM_p (tpy)	M_p-FM_p (tpy)	HAPs (tpy)
16.27	88.75	0.10	0.02	0.07	0.00
37.62	258.23	0.28	0.07	0.21	0.00
79.64	322.35	0.36	0.09	0.27	0.01
6.78	26.87	0.03	0.01	0.02	0.00
13.89	56.23	0.06	0.02	0.05	0.00
6.10	28.19	0.03	0.01	0.02	0.00
214.51	465.51	0.51	0.13	0.38	0.01
19.66	61.20	0.07	0.02	0.05	0.00
0.14	0.85	0.00	0.00	0.00	0.00
16.61	40.80	0.04	0.01	0.03	0.00
8.47	39.00	0.04	0.01	0.03	0.00
42.36	111.78	0.12	0.03	0.09	0.00
1.02	4.96	0.01	0.00	0.00	0.00
7.12	42.79	0.05	0.01	0.04	0.00
484.60	1683.47	1.86	0.46	1.39	0.03
156.23	678.29	0.75	0.19	0.56	0.01
0.03	0.26	0.00	0.00	0.00	0.00
222.65	784.74	0.87	0.22	0.65	0.01
240.27	708.59	0.78	0.20	0.59	0.01
63.37	259.59	0.29	0.07	0.21	0.00
126.40	857.29	0.95	0.24	0.71	0.01
95.57	513.57	0.57	0.14	0.42	0.01
248.74	635.82	0.70	0.18	0.53	0.01
410.05	1780.34	1.96	0.49	1.47	0.03
—	9449.48	10.42	2.60	7.81	0.16

WHITE STREET LANDFILL
HAP EMISSIONS

2001 Total Methane Generation (m^3/yr) = 19,070,000
LFG Collection Efficiency (%) = 75.0 %
Destruction Efficiency (%) = 98.0 %

2001 Emissions Q_p (m^3/yr)	M_p (kg/yr)	M_p (tpy)	FM_p (tpy)	M_p-FM_p (tpy)	Uncombusted HAPs (tpy)
16.66	90.90	0.10	0.03	0.08	0.00
38.53	264.47	0.29	0.07	0.22	0.00
81.56	330.14	0.36	0.09	0.27	0.01
6.94	27.52	0.03	0.01	0.02	0.00
14.23	57.59	0.06	0.02	0.05	0.00
6.25	28.87	0.03	0.01	0.02	0.00
219.70	476.76	0.53	0.13	0.39	0.01
20.13	62.68	0.07	0.02	0.05	0.00
0.14	0.87	0.00	0.00	0.00	0.00
17.01	41.78	0.05	0.01	0.03	0.00
8.68	39.94	0.04	0.01	0.03	0.00
43.38	114.48	0.13	0.03	0.09	0.00
1.04	5.08	0.01	0.00	0.00	0.00
7.29	43.82	0.05	0.01	0.04	0.00
496.32	1724.15	1.90	0.48	1.43	0.03
160.00	694.69	0.77	0.19	0.57	0.01
0.03	0.27	0.00	0.00	0.00	0.00
228.03	803.71	0.89	0.22	0.66	0.01
246.08	725.72	0.80	0.20	0.60	0.01
64.90	265.87	0.29	0.07	0.22	0.00
129.46	878.01	0.97	0.24	0.73	0.01
97.87	525.98	0.58	0.14	0.43	0.01
254.75	651.18	0.72	0.18	0.54	0.01
419.96	1823.36	2.01	0.50	1.51	0.03
—	9677.85	10.67	2.67	8.00	0.16

2002 Total Methane Generation (m^3/yr) = 19,550,000
LFG Collection Efficiency (%) = 75.0 %
Destruction Efficiency (%) = 98.0 %

2002 Emissions Q_p (m^3/yr)	M_p (kg/yr)	M_p (tpy)	FM_p (tpy)	M_p-FM_p (tpy)	Uncombusted HAPs (tpy)
17.08	93.19	0.10	0.03	0.08	0.00
39.49	271.12	0.30	0.07	0.22	0.00
83.62	338.45	0.37	0.09	0.28	0.01
7.12	28.21	0.03	0.01	0.02	0.00
14.59	59.04	0.07	0.02	0.05	0.00
6.40	29.60	0.03	0.01	0.02	0.00
225.23	488.76	0.54	0.13	0.40	0.01
20.64	64.26	0.07	0.02	0.05	0.00
0.14	0.90	0.00	0.00	0.00	0.00
17.43	42.83	0.05	0.01	0.04	0.00
8.90	40.95	0.05	0.01	0.03	0.00
44.48	117.36	0.13	0.03	0.10	0.00
1.07	5.21	0.01	0.00	0.00	0.00
7.47	44.92	0.05	0.01	0.04	0.00
508.81	1767.55	1.95	0.49	1.46	0.03
164.03	712.17	0.79	0.20	0.59	0.01
0.04	0.27	0.00	0.00	0.00	0.00
233.77	823.94	0.91	0.23	0.68	0.01
252.27	743.99	0.82	0.21	0.62	0.01
66.54	272.56	0.30	0.08	0.23	0.00
132.72	900.11	0.99	0.25	0.74	0.01
100.34	539.22	0.59	0.15	0.45	0.01
261.16	667.57	0.74	0.18	0.55	0.01
430.53	1869.26	2.06	0.52	1.55	0.03
—	9921.44	10.94	2.73	8.20	0.16

WHITE STREET LANDFILL
HAP EMISSIONS

2003 Total Methane Generation (m^3/yr)= 20,070,000
LFG Collection Efficiency (%) = 75.0 %
Destruction Efficiency (%) = 98.0 %

2003 Emissions					Uncombusted
Q_p (m^3/yr)	M_p		FM_p	M_p-FM_p	HAPs
	(kg/yr)	(tpy)	(tpy)	(tpy)	(tpy)
17.53	95.67	0.11	0.03	0.08	0.00
40.55	278.34	0.31	0.08	0.23	0.00
85.84	347.45	0.38	0.10	0.29	0.01
7.31	28.96	0.03	0.01	0.02	0.00
14.98	60.61	0.07	0.02	0.05	0.00
6.57	30.38	0.03	0.01	0.03	0.00
231.22	501.76	0.55	0.14	0.41	0.01
21.19	65.96	0.07	0.02	0.05	0.00
0.15	0.92	0.00	0.00	0.00	0.00
17.90	43.97	0.05	0.01	0.04	0.00
9.13	42.04	0.05	0.01	0.03	0.00
45.66	120.48	0.13	0.03	0.10	0.00
1.10	5.35	0.01	0.00	0.00	0.00
7.67	46.12	0.05	0.01	0.04	0.00
522.34	1814.56	2.00	0.50	1.50	0.03
168.39	731.12	0.81	0.20	0.60	0.01
0.04	0.28	0.00	0.00	0.00	0.00
239.99	845.85	0.93	0.23	0.70	0.01
258.98	763.78	0.84	0.21	0.63	0.01
68.31	279.81	0.31	0.08	0.23	0.00
136.25	924.05	1.02	0.25	0.76	0.02
103.01	553.56	0.61	0.15	0.46	0.01
268.11	685.33	0.76	0.19	0.57	0.01
441.98	1918.98	2.12	0.53	1.59	0.03
—	10185.34	11.23	2.81	8.42	0.17

Notes:

1. Q_P = Volumetric emission rate of pollutant. AP-42 Section 2.4 equation (3).
2. M_P = Mass generation of pollutant. If no collection exists, this is also equal to the mass emission rate of the pollutant. AP-42 equation (4).
3. FM_P = Fugitive emission rate from the landfill surface.
4. M_P - FM_P = Quantity of HAPs delivered to the control device.
5. The equations and all of the pollutant concentrations used to compute the estimated emissions are from AP-42 Section 2.4, as revised Nov. 1998.

Year	SUMMARY TABLE				Total
	LFG	HAPs (tpy)			Fugitive
	(cfm)	Generated	Emitted	Uncombusted	(tpy)
1998	2,400	9.99	2.50	0.15	2.65
1999	2,449	10.19	2.55	0.15	2.70
2000	2,503	10.42	2.60	0.16	2.76
2001	2,562	10.67	2.67	0.16	2.83
2002	2,627	10.94	2.73	0.16	2.90
2003	2,698	11.23	2.81	0.17	2.98

VOC FLARE FUGITIVE EMISSIONS CALCULATIONS

Year	NMOC Generation (ton/yr)	LFG Collection Efficiency (%)	Conversion From NMOCs to VOCs (%)	Fugitive Emissions from Flare (%)	Fugitive VOC Emissions (ton/yr)
1999	17	75	39	2	0.10
2000	18	75	39	2	0.11
2001	18	75	39	2	0.11
2002	19	75	39	2	0.11
2003	19	75	39	2	0.11

Sample Calculation:

(17 tpy) x (0.75) x (0.39) x (0.02) = 0.10 tpy

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	Diesel #1
City:	Greensboro
State:	North Carolina
Company:	White Street Landfill
Type of Tank:	Horizontal Tank
Description:	Diesel Fuel Storage Tank
Tank Dimensions	
Shell Length (ft):	34.50
Diameter (ft):	10.00
Volume (gallons):	20,000.00
Turnovers:	14.00
Net Throughput (gal/yr):	280,000.00
Is Tank Underground (y/n):	Y
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Light
Shell Condition:	Good
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Greensboro, North Carolina (Avg Atmospheric Pressure = 14.3 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	57.18	57.18	57.18	56.74	0.0059	0.0059	0.0059	130.0000			188.00	Option 5: A=12.101, B=8907

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	5.12	0.00	5.12

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification	
User Identification:	Gasoline #1
City:	Greensboro
State:	North Carolina
Company:	White Street Landfill
Type of Tank:	Horizontal Tank
Description:	Unleaded Gasoline Storage Tank
Tank Dimensions	
Shell Length (ft):	27.00
Diameter (ft):	8.00
Volume (gallons):	10,000.00
Turnovers:	2.00
Net Throughput (gal/yr):	20,000.00
Is Tank Underground (y/n):	Y
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Light
Shell Condition:	Good
Breather Vent Settings	
Vacuum Settings (psig):	0.00
Pressure Settings (psig):	0.00

Meteorological Data used in Emissions Calculations: Greensboro, North Carolina (Avg Atmospheric Pressure = 14.3 psia)

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	57.18	57.18	57.18	56.74	6.5885	6.5885	6.5885	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	194.52	0.00	194.52

APPENDIX D

REGULATORY APPLICABILITY

REGULATORY APPLICABILITY
WHITE STREET LANDFILL
FEDERAL AIR OPERATING PERMIT APPLICATION

The following is a review of the federal and state regulations applicable to the Title V Air Operating Permit Application for the White Street Landfill, Greensboro, North Carolina.

FEDERAL

40 CFR 60, Subpart WWW – New Source Performance Standards

- A MSW landfill is subject if it has a capacity of 2.5 Million Mg or more that was constructed or modified capacity after May 30, 1991 and has NMOC emissions of 50 Mg/yr or more. If so, it must submit a collection and control design plan within 1 year and install within 18 months of plan submittal.
- *The White Street Landfill has a capacity greater than 2.5 million Mg, however, does not have NMOC emissions greater than 50 Mg/yr. The Landfill recently completed a Tier 2 analysis (May 17, 1999) that exempted it from having to install a collection/control system for the next five years.*

STATE

SECTION .0100 – GENERAL PROVISIONS

15A NCAC 2Q.0101(a) – Required Air Quality Permits

- States all the pollutants that are regulated and subject to permitting.

15A NCAC 2Q.0102 – Activities Exempted From Permit Requirements

- States the activities that are exempted from obtaining a state air permit.

15A NCAC 2Q.0103 – Definitions

- Defines various terms used throughout the permitting regulations.

SECTION .0500 – TITLE V PROCEDURES

15A NCAC 2Q.0502 – Applicability

- Details the facilities that are required to obtain a state operating permit.

- *The White Street Landfill is applicable under 15A NCAC 2Q.0502(a)(7) that states that facilities designated by the EPA under the requirements of 40 CFR Part 70 are subject to permitting.*

15A NCAC 2Q.0503 – Definitions

- Defines various terms used in the Title V permitting section.

15A NCAC 2Q.0505 – Application Submittal Content

- Details the information required to be submitted with an application package.

15A NCAC 2Q.0508 – Permit Content

- Defines the information that will be specified or identified on the final permit issued from the state.

SECTION .1700 – MUNICIPAL SOLID WASTE LANDFILLS

15A NCAC 2D.1702 – Applicability

- Details the MSW landfills that are applicable to the standards and conditions of 15A NCAC 2D Section .1700.
- *The White Street Landfill is applicable to this standard since the Landfill has accepted waste since November 8, 1997 and has permitted for increased capacity beyond the original design.*

15A NCAC 2D.1703 – Emission Standards

- Details the gas collection and control emissions standards that MSW landfills must abide and the conditions imposed therein.
- *The White Street Landfill is applicable to condition (1) since it has a design capacity greater than 2.75 million tons; however, the landfill does not meet condition (2) since it does not have NMOC emissions greater than 55 tons per year. Therefore, the landfill is not required to have a LFG collection/control system. The landfill does have an active LFG collection system in place that is part of an on-going LFGTE recovery project.*

APPENDIX E

CARBON MONOXIDE EMISSIONS VARIANCE MEMORANDUM

Environmental Consultants
218 E. Tremont Avenue, Suite C
Charlotte, NC 28203-5364
704 377-4766
FAX 704 377-4768

SCS ENGINEERS, PC

MEMORANDUM

May 14, 1999
File No. 0297062.01

TO: Rahul Thaker, NCDENR

FROM: Steve White, SCS Engineers, P.C. SCW

SUBJECT: Revision to Title V Air Operating Permit: Major Source Status
Blackburn Landfill – Catawba County, North Carolina

The purpose of this memorandum is to covey our understanding of the Blackburn Landfill's current emission status under the Title V air operating permit. This understanding is based on our telephone conversion on May 13, 1999.

SCS submitted a Title V application to NCDENR in March 1999. The executive summary and application form E1 of the submitted permit application maintain that the Blackburn Landfill is a major source by Carbon Monoxide (CO) emissions. This statement was based on our understanding that total facility emissions exceeding 100 tons per year (tpy) of CO would qualify the site as a major source.

Since submitting the March 1999 Title V permit application to the State, we have learned through discussions with Booker Pullen of NCDENR that secondary emissions of CO from a control device (such as a candle flare) are not applicable in determining a site's major source status. Thus, of Blackburn's maximum anticipated CO emissions of 141.6 tpy, 60.8 tpy are attributed to secondary emissions from the flare. Excluding the flare emissions as non-applicable in determining major source status, Blackburn's effective CO emission rate reduces to 80.8 tpy, which is lower than major source threshold of 100 tpy. The Blackburn Landfill is not a major source for CO based on the exclusion of secondary emissions.

SCS understands that NCDENR has issued a Title V operating permit to Catawba County for the Blackburn site. Although we have not yet seen a copy of the permit issued by NCDENR, we understand (from NCDENR) that there are no provisions in it that would require further modification, notwithstanding the information presented above. Apparently, the issued permit does not indicate in any way that Blackburn is a major source for CO.

Although NCDENR suggests that no action is necessary, we are including attachments with this memorandum that show revisions for relevant portions of the Title V permit application. These revisions, which include Form E1 and the Executive Summary, provide that the site is not "major" by "emission level," as only 80.8 tpy are emitted with regard to major source status. The revised form E1 indicates that the site is "major" by "category" only. In fact, the site is not a major source, as would be implied by the term "major," but it is compelled to prepare a Title V permit application by its category as a New Source Performance Standards (NSPS) landfill. These attachments are submitted to NCDENR for whatever use it deems necessary.

Please note also that during the execution of this application, our name has officially changed to SCS Engineers PC from Stearns and Conrad. We apologize for any confusion this might have caused.

If you have any questions or comments, please feel free to contact me at (704) 377-4766.

APPENDIX F

PM-10 EMISSIONS CLARIFICATION RECORD

Environmental Consultants

11260 Roger Bacon Dr.
Reston, VA 22090

703 471-6150
FAX 703 471-6676

SCS ENGINEERS

RECORD OF TELEPHONE CONVERSATION

Project No.: 0298302.02 Date: 8/23/99 Time: 2:50 a.m. p.m.

Project Name: Greensboro (White Street Landfill) Title V

Subject: Are Fugitive PM-10 Emissions from Landfilling Operations (ie. haul roads, borrow ops) to be included in a Title V Air Application?

Person Calling: Kris Carlson

Person Called: Booker Pullen, Envir. Eng II

Organization: NCDENR Air Quality Division Permitting

Phone No.: E-mailed Him + he called me back

Notes: PM-10 Emissions from MSW Landfills from Fugitive sources (i.e., the haul roads, active face, + borrow area) are not required to be included in a Title V application to the state of NC at this time. However, PM-10 Emissions from point sources such as tub grinders + utility flares are required, as are fugitive NMOC's, VOC's, + HAP's from the Landfill.